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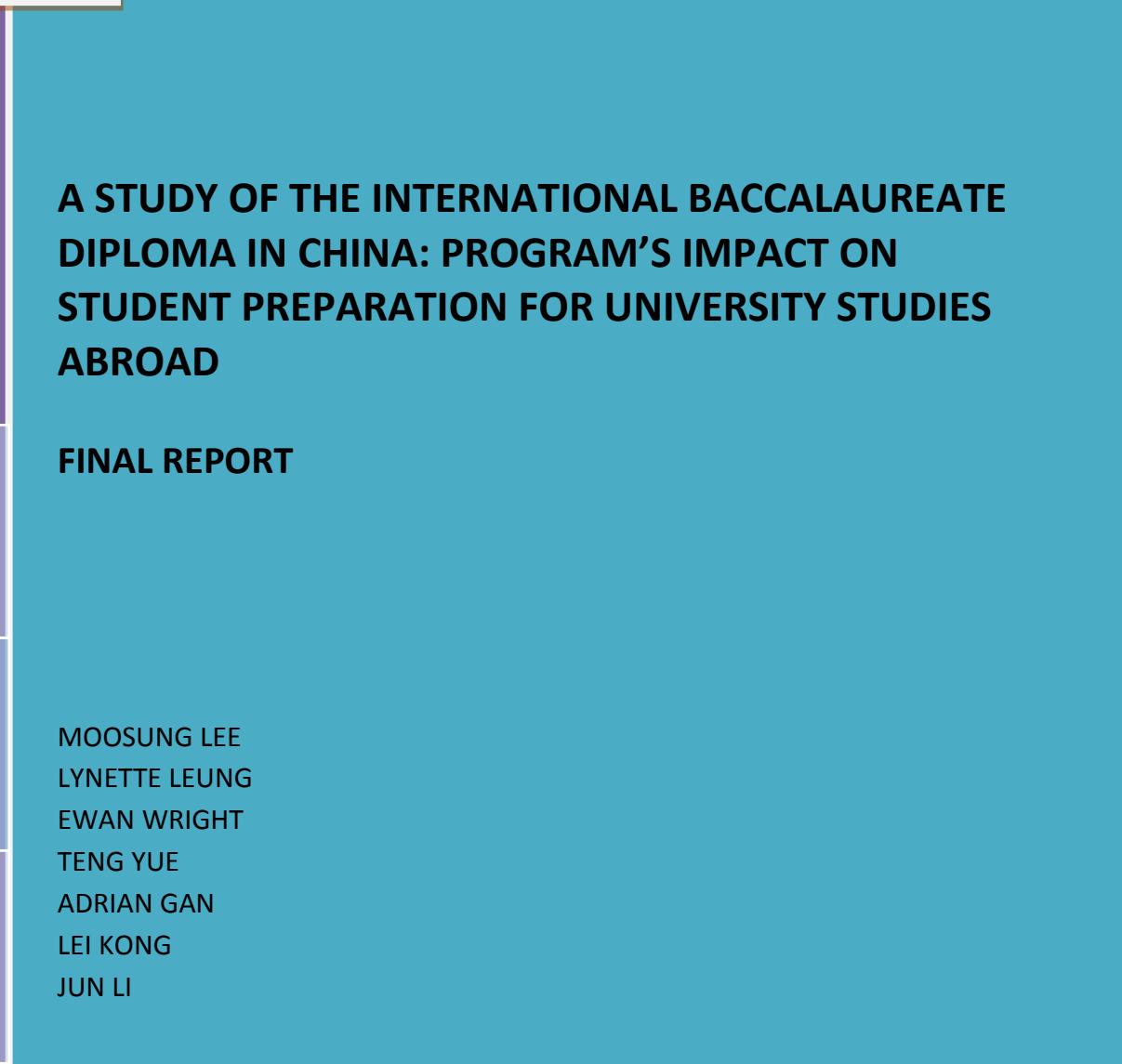
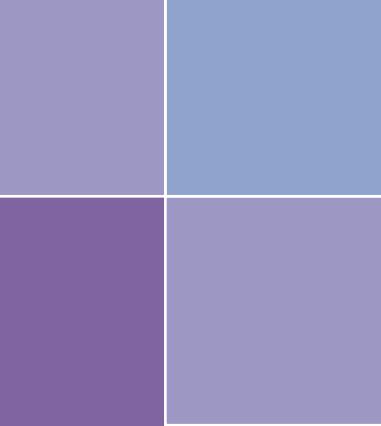
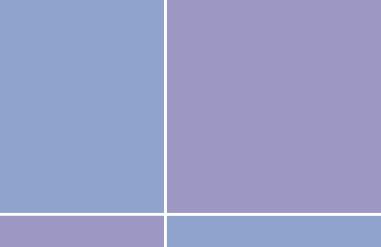
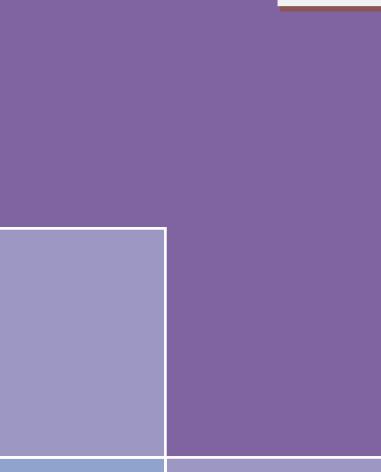
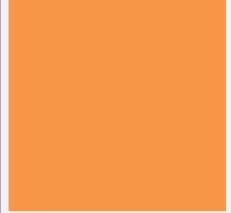
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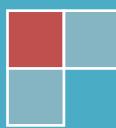
FINAL REPORT

MOOSUNG LEE
LYNETTE LEUNG
EWAN WRIGHT
TENG YUE
ADRIAN GAN
LEI KONG
JUN LI



EPU

EDUCATION POLICY UNIT
FACULTY OF EDUCATION UNIVERSITY OF HONG KONG



THE RESEARCH TEAM APPRECIATES THE FINANCIAL SUPPORT OF THE IB FOR THIS RESEARCH PROJECT. THE RESEARCH TEAM ALSO THANKS BRADLEY SHRIMPTON AND MELISSA GORDON FOR THEIR INSIGHTFUL COMMENTS AND SUGGESTIONS ON EARLIER DRAFTS OF THIS REPORT. THE VIEWS EXPRESSED IN THIS REPORT ARE THE SOLE RESPONSIBILITY OF THE RESEARCH TEAM AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE INTERNATIONAL BACCALAUREATE.

Corresponding researcher:

Dr. Moosung Lee

Associate Professor, Faculty of Education

Deputy Director, Education Policy Unit

419 Runme Shaw Building

University of Hong Kong

Pokfulam, Hong Kong SAR

Telephone: (852) 28592525

Email: moosung1@hku.hk

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EXECUTIVE SUMMARY

The number of International Baccalaureate (IB) schools worldwide has increased dramatically in recent years responding to burgeoning demand for both an internationally oriented education and an internationally validated path to higher education institutions. China is among a group of countries at the forefront of this trend with the number of schools adopting IB programs, and the International Baccalaureate Diploma Program (IBDP) in particular, growing at a seemingly exponential rate. Indeed, as of November 2013 there were 63 IB schools authorized to offer the IBDP in China, representing a sevenfold increase since 2003 (International Baccalaureate, 2013a). Despite such fast growth (and by implication, popularity) of IBDP schools in China, empirical studies exploring the impact of the IBDP in China on students' university preparation and success are practically non-existent. This vacuum has led to the current pioneering research, which sought data and analysis that illuminated the impact of the IBDP in China with a focus on students' preparation for university studies abroad. To achieve this, the research team from the University of Hong Kong undertook a multi-method four-phase study. The four phases were analytically separate but conceptually integrated and collectively explored the impact of the IBDP on student learning outcomes in terms of university entrance, preparation, and performance. Specifically, this involved 1) Quantitative analysis of IBDP school archival data on university entrance of IBDP graduates over time, 2) Quantitative analysis of survey data on IBDP experiences, combined with IBDP exam data and university GPA, 3) Qualitative analysis of teacher, administrator, and student interview data from five case study IBDP schools, and 4) Integration of both quantitative results and qualitative findings.

Summary of Findings

- **1.** Our quantitative and qualitative data shed light on the diversity of nationality and citizenship of IBDP students in China. We found that a majority were of Asian heritage but with non-Chinese citizenship (63% of the IBDP graduates in the 2011 and 2012 cohorts). This included U.S. and Western European country passport holders of Asian descent or nationals of other East Asian countries. The primary reason for the under-representation of Chinese nationals was that, in most cases, they are legally restricted from attending international IBDP schools in China.
- **2.** Our results signified that the IBDP served as a successful channel for students in China to enter top-ranking universities. From our archival data, 72% of IBDP graduates in China from 2002 to 2012 attended one of the top 500 universities in the world;¹ the median ranking was 71. Over

¹ We used three major ranking tables: Academic Ranking of World Universities (ARWU) offered by Shanghai Jiao Tong University, QS World University Rankings, and the Times Higher Education World University Rankings. See page 16 for more details.

half (51%) of IBDP graduates went to the U.S. for university. Based on data from our multi-site case study, we proposed a threefold explanation for this U.S. focus. First, the popularity of U.S. universities could be an outcome of the high proportion of U.S. passport holders among IBDP students in China. Interviews with students revealed that nationality could influence choice of university destination due to tuition-fee incentives and existing social support networks. Second, this reflected the geographical concentration of academically strong institutions in the U.S. Third, high admission rates for IB students are indicative of the growing recognition of the IBDP by universities in the U.S.

- **3.** Teachers and administrators in our case study expressed the view that the IBDP prepared students well for university studies. They argued that many IBDP graduates “coast” through the early stages of university, as the subject content covered over the IBDP was often equivalent to that of the first year of university. Our quantitative analysis reinforced this position, revealing that high achievers in IBDP exams performed well in their university assessments, based on self-reports, and that IBDP exam scores could predict a student’s potential academic ability and academic success in university.
- **4.** Case study teachers and administrators agreed that the development of core study skills including communication, critical thinking, and time management were often more important for university preparation, compared to merely covering similar subject content. Following this, current IBDP students were confident that the study skills gained during the IBDP, especially time management and essay writing, would stand them in good stead for university studies. Moreover, students and teachers often perceived IBDP graduates to be *better* prepared for university compared to A-Level, AP program, and Gaokao graduates. Yet, participants noted that the breadth and rigor of the IBDP could lead to issues with stress and anxiety among students.
- **5.** To support the development of study skills, teachers reported endeavouring to go beyond a rote-learning approach to employ “student-centered teaching” methods including classroom discussions, group work, and presentations. They considered this especially important for some Asian students who initially struggled with skills such as critical thinking and classroom interaction. However, teachers also contended that the requirement to cover a large volume of content alongside a pragmatic focus on assessments often restricted such pedagogical practices.
- **6.** Interviewees considered that key curriculum and assessment requirements of IBDP subjects (hereafter ‘Subject Requirements’) - including a broad curriculum with subjects in six areas, studying at least three subjects in depth, spreading all subjects over two years, and a range of assessment strategies - were valuable in enabling academic success at university.² This

² See Pages 24-31 for details about measures of Subject Requirements.

perception was shared by IBDP graduates completing their first or second year of university, with survey participants rating IBDP Subject Requirements as slightly or moderately helpful to their making their university study successful. Our inferential statistical analysis supported this by indicating that Subject Requirements was a significant predictor of university preparation.

- **7.** Case study participants placed significant emphasis on IBDP ‘Core Components’ - comprised of Creativity, Action, Service (CAS), Extended Essay (EE), and Theory of Knowledge (TOK) - for providing students with a holistic education relevant for university life. Despite this, our quantitative analysis found that Core Components was rated by IBDP graduates as only slightly helpful to making their university study successful. This corresponded to concern among interviewees that, as CAS in particular was not sufficiently assessed, it was often neglected by high-achieving students in a results-oriented culture.
- **8.** Our quantitative data analysis revealed that non-cognitive domains of the IB Learner Profile, such as “communicating effectively with others” were regarded by IBDP graduates as slightly to moderately helpful for university preparation. Furthermore, the IB Learner Profile was a strong predictor of University Preparation, suggesting that non-cognitive IB Learner attributes are also useful for university preparation. On the other hand, some interviewees reported that due to limited guidance from the IB on how to implement the Learner Profile, its promotion largely depended on the discretion of schools. In other words, while IB Learner Profile on non-cognitive domains promotes the well-rounded development of students (e.g., integrity, inter-cultural understanding, and communication skills) which is an integral part of university preparation, in a results-oriented culture, where non-academic aspects of the curriculum often fade into the background, some components of the Learner Profile may be under-prioritized.

Overall, this report offered new insights into how the IBDP in China prepares students for university studies abroad. Our results revealed confidence among IBDP stakeholders - including administrators, teachers, and students - that the IBDP in China is highly regarded by universities worldwide. Quantitative analysis reinforced this view, revealing that the IBDP is successful in enabling IBDP graduates entry into top-ranking universities worldwide. Qualitative data further suggested that the rigor of the Subject Requirements, alongside more holistic aspects of the Core Components, provided students with a strong knowledge of academic content and study skills relevant for university progression. Yet, there was also concern among case study interviewees that the Learner Profile and CAS may be under-prioritized in the results-oriented culture of IBDP schools in China. This example is indicative of the challenges that may arise as the IB expands to new educational contexts around the world.

1. INTRODUCTION

1.1. RESEARCH GOALS

International schools have grown dramatically in popularity around the world in recent years in response to the burgeoning demand for high quality international education programs. In particular, International Baccalaureate (IB) schools are key players responding to the growing demand for international education (Lee, Hallinger, & Walker, 2012a, 2012b). Over the past fourteen years, the number of IB programs adopted by schools around the world has increased by almost 400%, from 945 schools in 1999 to 3,669 in 2013 (IB, 2013a). Amidst this trend of exponential growth demonstrated by IB schools globally, Asia Pacific has seen the highest increase in the number of IB schools since 2000 (IB, 2009, cited in Lee *et al.*, 2012a). As of November 2013, 839 IB programs had been adopted by 596 schools in the Asia Pacific region (IB, 2013a).

Within the region, in recent years China has evidenced an impressive gain in the number of schools adopting IB programs in general and the International Baccalaureate Diploma Program (IBDP) in particular. Specifically, the IBDP program was first launched at the International School of Beijing in 1991, and as of November 2013, there were 63 IB schools authorized for the implementation of the IBDP in China.³ Of these, 43 schools have been authorized since 2003 (IB, 2013a), illustrating the fast growth of IBDP schools in China in recent years.

Despite such fast growth (and by implication, popularity) of IBDP schools in China, empirical studies exploring the impact of learning experiences of students who have undertaken the IBDP in China in terms of their university preparation and success seem to be almost nonexistent. This vacuum has led to the current research, which seeks data and analysis that illuminate the impact of the IBDP in China with a focus on students' preparation for university studies abroad. With this in mind, the primary goal of this research is to investigate the impact of the IBDP on students' university preparation and performance. Specifically, this research centers on the following four goals:

- To document the patterns of university destination of IBDP graduates in China in recent years
- To identify the relationships among IBDP learning experiences, exit scores on IB exams, university entrance, and university academic performance
- To illuminate how and why IBDP learning experiences have an impact on university academic performance and

³ During the period in which the study was conducted the number of schools offering the IBDP in China grew from 52 to 63.

- To shed light on how and why certain pedagogical approaches support students' preparation for university study abroad.

The report consists of four main parts. First, the report describes major results from quantitative research on both archival data and survey data of university destinations. Second, it further expands and elaborates upon results of the quantitative research by presenting major findings from qualitative case studies of five IBDP schools in China. Third, a brief synthesis of both quantitative and qualitative findings is offered. Finally, implications of key findings for research and practice will be discussed in depth.

1.2. RESEARCH DESIGN

We planned a four-phase, multi-method study, the phases of which are analytically-separate but conceptually-integrated, for the purpose of examining the impact of the IBDP on student learning outcomes in terms of university entrance, preparation, and performance. The mixed methods study employed a sequential explanatory design (Creswell, Plano, Gutmann, & Hanson, 2003).

Given the objectives of this research project, our implementation of this design entailed four phases (see also Figure 1 below):

- **Phase 1.** Quantitative analysis of IBDP school archival data on university entrance of IBDP graduates over time (i.e., descriptive analysis)
- **Phase 2.** Quantitative analysis of survey data on IBDP experiences, combined with IBDP exam data and university GPA (i.e., descriptive analysis and structural equation modeling)
- **Phase 3.** Qualitative analysis of interview data from five case study IBDP schools (i.e., using an iterative process of data collection from the five schools as a constant comparative method for cross-case analysis; semi-structured, focus group interviews with IBDP teachers and IBDP students, and individual interviews with IBDP coordinators and headteachers; thematic network analysis) and
- **Phase 5.** Integration of both quantitative results and qualitative findings.

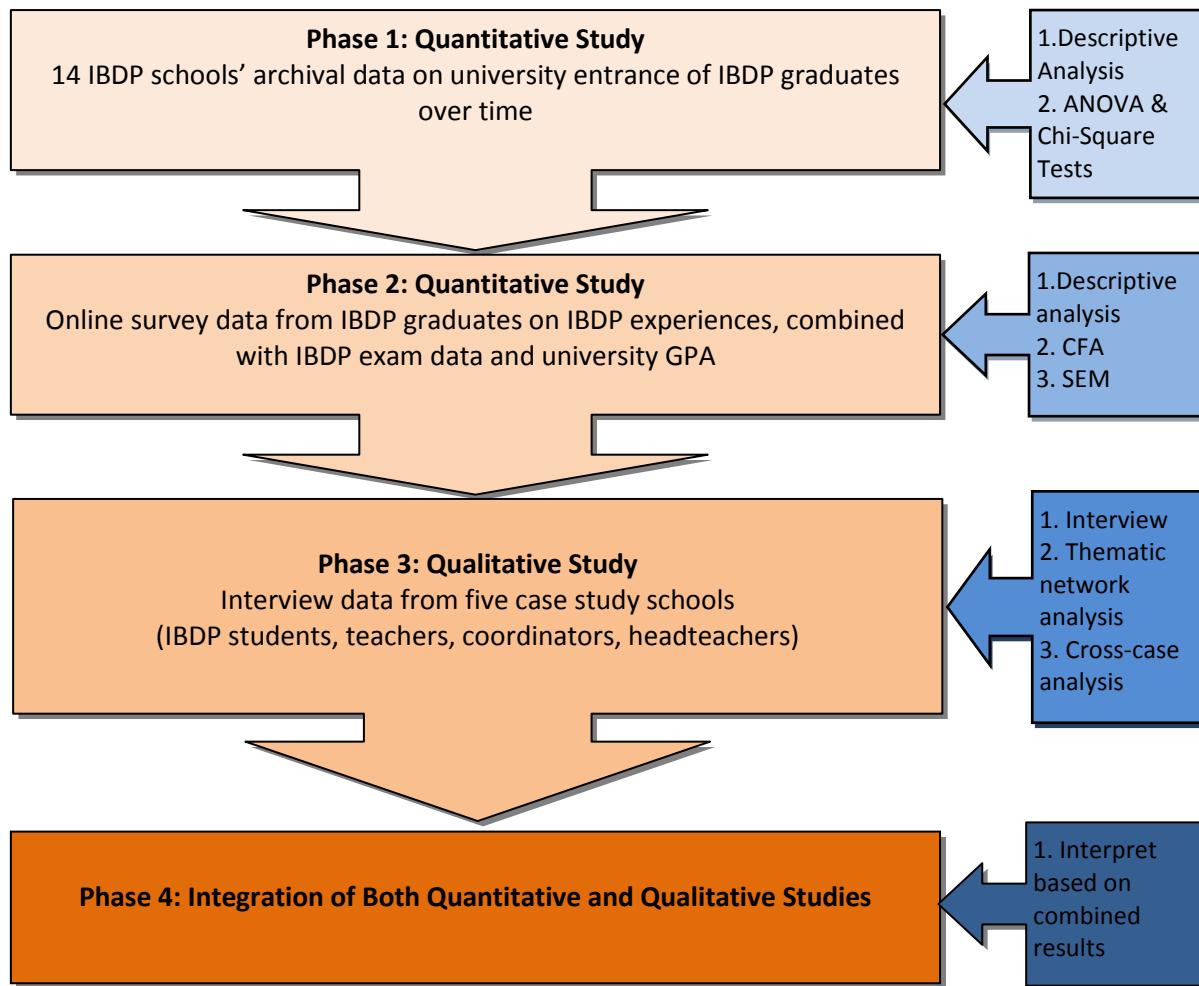


Figure 1. Overview of a Sequential Explanatory Mixed Methods Research Design

2. QUANTITATIVE STUDY

2.1. DOCUMENTATION OF THE PATTERN OF UNIVERSITY DESTINATION OF IBDP GRADUATES FROM CHINA

2.1.1. INTRODUCTION

International education and its schools and programs are committed to international student mobility (ISM) in both ideology and practice. The IB program in particular, which has been argued to be representative of international education ideologies (Hayden & Thompson, 1995), has a mission “to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding respect” (IB, 2013b). Yet, it has been contended, that in practice, the IB has been about an “educational Nansen passport” (Peterson, 1972, p. 19) and synonymous with “education for mobile elite” (Tarc, 2009, p.36). Indeed, the inception of the IB in 1968 foreshadowed the paradigm shift that demanded the global transfer of the children of diplomatic and multinational corporation employees to higher education institutions, equipping students with the skills to operate as professionals in the international marketplace of business (Bunnell, 2008; Fox, 1998; Peterson, 1987).

There have been arguments that the ideology of the IB has been at odds with the reality of its practical concerns (James, 2005) and that ideology has yielded to the more practical demands of fitting in the IB program into diverse cultures and value systems around the world (Wang, 2012). In terms of ISM, it is a concern that the IB is merely a means to gaining world-class academic credentials to become part of the transnational capitalist class (Sklair, 2001) and a passport that can be acquired across the globe for those who can afford it. However, it is a counterargument that the IB is intrinsically about acquiring a cosmopolitan identity (Beck, 2004) rather than a ticket to academic and professional success. The IB and its favorability for ISM then becomes not just a means to an end but part of a person’s international outlook throughout their entire lives (Brooks & Everett, 2008). At the same time, it should be noted that approximately half of all IB schools around the world are public sector schools. For example, in the United States the vast majority of IB schools are state funded (IB, 2012a).

As international schools and educational programs re-emerged in the big cities and coastal areas of China, after the Open Door Policy in 1978, the IB entered mainland China in 1991 (Wang, 2012). As of 2013, there were 63 IBDP schools operating in China. Students studying in IB schools in China

constitute as a discrete population in their own right. According to our online survey targeting IBDP graduates in 2011 and 2012 from IBDP schools in China, almost all of the 260 respondents indicated that they were foreigners (99.6%) in terms of nationality. This is because for mainland Chinese students, there is a legal restriction that prevents them from attending international schools.⁴ Data obtained from the IB, outlining the self-reported nationality of IBDP graduates in the 2011 and 2012 cohort, revealed that student nationalities included countries in East Asia (63% of students), Europe (15%), North America (14%), Australasia (4%), and others (4%). Looking at the East Asia data specifically, almost half (47% of student) of students reported their nationality as Chinese, this was followed by Korean (22% of students), Taiwanese (8%), Singaporean (8%), and others (15%).

[Data obtained from the IB, outlining the self-reported nationality of IBDP graduates in the 2011 and 2012 cohort, revealed that student nationalities included countries in East Asia (63% of students), Europe (15%), North America (14%), Australasia (4%), and others (4%).]

Our qualitative and quantitative data shed light on the high proportion of students self-reporting Chinese nationality, despite legal restrictions on Chinese nationals enrolling in international schools. First, in our multi-sited case study of five IBDP schools in China, administrators explained that many of their students were North American or Western European country passport holders of Chinese descent. Second, this point was reinforced by our online survey of IBDP graduates, which showed that 60.8% were U.S. or Western Europe passport holders and 28.1% held Asian country passports only. In other words, many of the IBDP students self-reporting Chinese nationality were non-Chinese nationals of Chinese heritage. We surmise, therefore, that a majority of IBDP students in China are nationals of other Asian countries or passport holders of Western countries of Asian descent. Research of this discrete population can yield fresh insights into the latest trends of ISM in China in light of the largely individualized accounts of transnational mobility (Brooks & Waters, 2010) in extant literature.

Despite the growing population of IBDP schools in China, alongside the pedagogically progressive image perceived by key stakeholders such as parents and students (Doherty, 2009) and the contribution of IB schools to ISM, nothing is known about the patterns of university destination of IBDP graduates from China. Although a study (IB, 2007a) conducted by the internal research team of the International Baccalaureate Organization (IBO) documented the pattern of university entrance of IBDP graduates from U.S. high schools and related acceptance rates, equivalent information on IBDP

⁴ However, there are “local” schools in China which implement IB programs. That is, some mainland Chinese students have access to IB programs through local schooling systems (source: IB School authorization data).

graduates from China is missing from the existing literature. In response, we investigated the university destinations of students who graduated from IBDP schools in China since 2002. By seeking and compiling information about graduates' names and their university destinations over the last ten years from each of the 14 IBDP schools in China included in our study, we explored whether there were any patterns in their university destinations in terms of geographical regions and university ranking over time. The two key questions in this analysis were: Where do students who have graduated from IBDP schools in China attend university? Are there any trends in their university destinations in terms of geographical region or university by ranking?

With regards to data analysis, we primarily used a series of descriptive analyses, including chi-square tests and ANOVA, for identifying distinctive patterns of university destinations (e.g., by geographical regions, university prestige, etc.). Missing values (5.2%) were not imputed for this analysis.

Before going further, we wish to note several limitations in our analysis. First, due to the voluntary participation of IB schools in this study, the IBDP graduates in this analysis are not representative of all IBDP graduates in China over the last 10 years. Second, we initially planned to identify the impact of the IBDP on university entrance patterns by comparing students' enrolment in foreign universities "before and after" the IB schools' adoption of the IBDP. However, this was not possible due to the absence of university destination records from the period when the participating schools were non-IB schools. To provide an alternative comparison, we undertook a data mining activity using the *"Blue Book of Global Talent: Annual Report on the Development of China's Study Abroad"* (Wang, 2012), which provided various patterns of Chinese undergraduate students' study abroad in 2011. We compared IBDP graduates with Chinese undergraduates with the aim of teasing out distinctive patterns of IBDP graduates' university destinations. However, we acknowledge that this comparison was not based on the same cohort in terms of age, education level, and citizenship.

2.1.2. DATA COLLECTION AND ANALYSIS

As an initial recruitment method for the project, a mass email was sent out by the IBO office in Singapore to 43 out of the 52 authorized IBDP schools (as of 2012) in China. As a result of a follow-up through email correspondence, registered mail letters, and long distance phone calls over a period of three months, 22 schools out of the 43 initially expressed interest in supporting the project. However, due to school commitments, 16 schools provided data sets, of which 14 schools were able to offer data sets particularly on university destinations.

Data collection took the form of template tables emailed to the participant schools asking them to chart their graduates' university destinations of each cohort, anonymously without disclosure of student names. The schools were asked to trace back the university destinations of students from their 2012 cohort to the year of adoption of the IBDP. Some schools with a long history of IBDP implementation were only able to provide a maximum of ten years of data, due to the absence or dearth of records on graduates' university destinations before 2000. As such, the final sample size comprised 1,612 students from 14 schools during the period between 2002 and 2012. A series of descriptive analyses were employed in order to identify certain patterns of IBDP graduate university destination. These included frequency analysis, chi-square, and ANOVA tests.

2.1.3. RESULTS OF THE DATA FROM 2002 TO 2012

Overall Pattern: As illustrated in Figure 2 for the IBDP graduates from 2002 to 2012, the most popular destination were U.S. universities. Slightly over half of IBDP graduates (51.1%) chose a U.S. university as their university destination. The second most chosen destination was U.K. universities, which accounted for 11.4% of all the students. Other popular choices were Canadian universities (10.7%), Asian universities (6.9%, excluding universities in HK/Singapore), Hong Kong/Singapore universities (5.8%), European universities (4.4%, excluding U.K.), and Australia/New Zealand universities (4.0%).

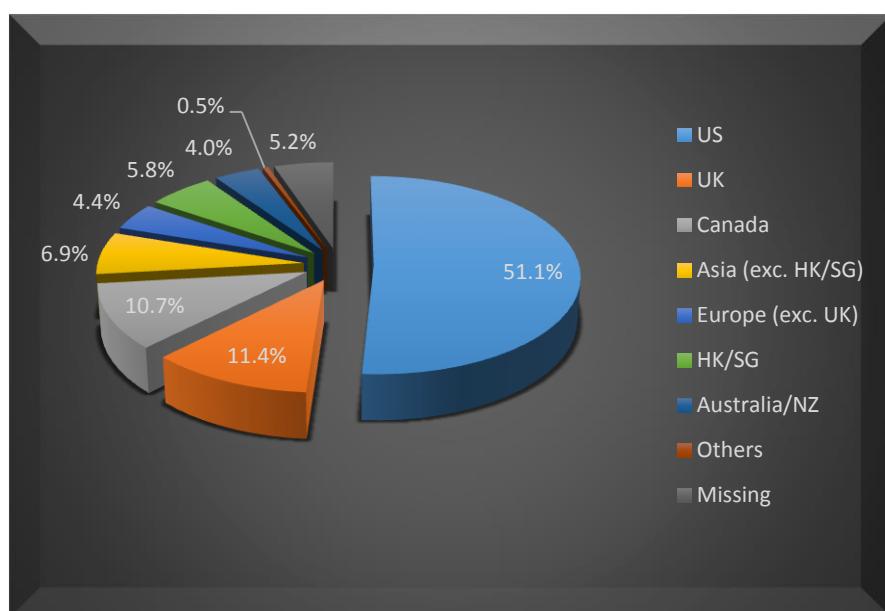


Figure 2. University destinations of IBDP graduates from 2002 to 2012 by region/country

Notes: N = 1,612

IBDP Graduates vs. Chinese Undergraduates: Figure 3 shows a comparison between IBDP graduates (2002 to 2012) and Chinese undergraduates who studied abroad in 2011 in terms of university destination. We found that U.S., Canada, and the U.K. were the three major destinations for Chinese undergraduates. Comparatively, IBDP graduates tended to choose U.S. universities (51.1%) considerably more than their Chinese undergraduate counterparts (U.S. and Canada combined was 28.6%) whereas IBDP graduates tended to choose UK universities (11.4%) considerably less than their Chinese undergraduate counterparts (24%).

[Comparatively, IBDP graduates tended to choose U.S. universities (51.1%) considerably more than their Chinese undergraduate counterparts (U.S. and Canada combined was 28.6%).]

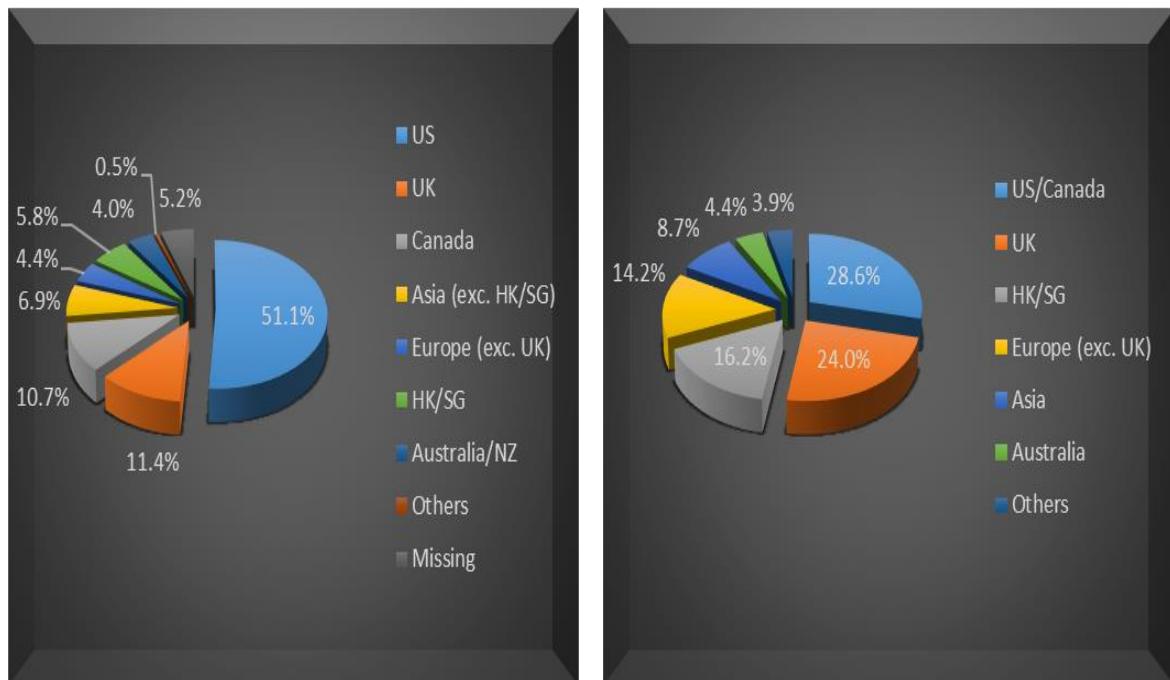


Figure 3. University destinations of IBDP graduates from 2002 to 2012 (left) vs. Study abroad of Chinese undergraduates in 2011 (right) by region/country

Notes: N of IBDP graduates = 1,612; N of Chinese undergraduates = 339,700⁵

University Destination by Language: In terms of university destination by language (i.e., universities in English speaking countries vs. universities in non-English speaking countries), a vast majority of

⁵ For the data on Chinese undergraduates, U.S. and Canada could not be separated since the original information was categorized as US/Canada.

the IBDP graduates (83.1%) chose universities in English speaking countries (e.g., U.S., U.K., Canada, and Australia), and a much smaller proportion (11.5%) went to university in non-English speaking countries (See Figure 4). Figure 3 also illustrates that the IBDP graduates were more likely than Chinese undergraduates to attend universities in English speaking countries (83.1% vs. 73.2%). This indicates that the English language skills of most IBDP students in China are sufficient for entry to English-speaking universities.

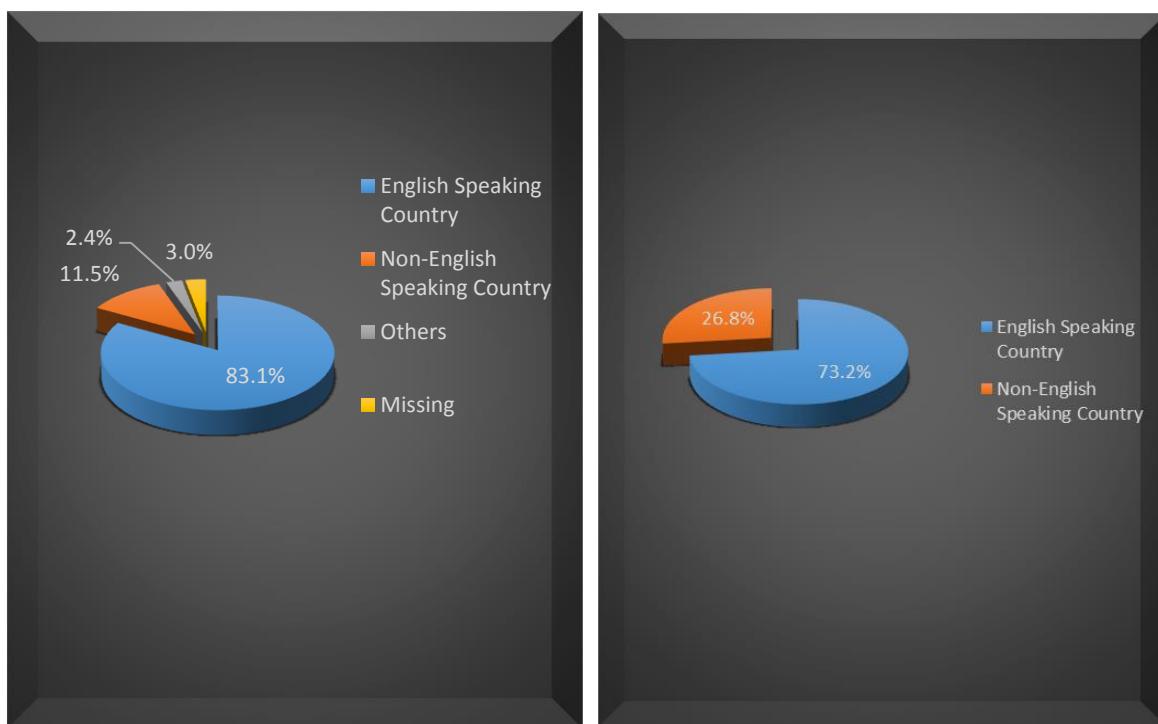


Figure 4. University destinations of IBDP graduates from 2002 to 2012 (left) vs. Study abroad of Chinese undergraduates in 2011 (right) by language

Notes: N of IBDP graduates = 1,612; N of Chinese undergraduates = 339,700

Type and Ranking of University Destination: We also investigated IBDP graduate university destination by type of university and ranking. We differentiated university destination into five types: 1) world top 500 universities, 2) universities not in world top 500, 3) special colleges/universities, 4) top 200 liberal arts colleges in the U.S., and 5) others. Specifically, to generate the first group of universities, we used three major university ranking tables published in 2011/12: Academic Ranking of World Universities (ARWU) offered by Shanghai Jiao Tong University, QS World University Rankings, and the Times Higher Education World University Rankings.⁶ The second group was comprised of universities not ranked in any of the three ranking tables. The third group were specialized colleges/universities for hotel management, design, arts and music, and technology (e.g., Parsons the New School for Design, Royal College of Music), which were not considered by ranking tables. The fourth group was liberal arts colleges in the U.S., which were excluded in the ranking tables, which focused on more comprehensive universities. We separated liberal arts colleges as a group because they were considered to be academically strong institutes despite not being included in ranking tables (Ruscio, 1987). The “others” were the last group of students who went on gap year, served in military service or for any other reason their destination could not be identified.

[A majority of the IBDP graduates (71.6%) from 2002 to 2012 attended one of world top 500 universities.]

Based on this grouping, Figure 5 shows IBDP graduate university destination from 2002 to 2012 by type of university and rankings. Notably, a majority of the IBDP graduates (71.6%) from 2002 to 2012 attended one of world top 500 universities. Another 2.1% of graduates chose one of the top 200 liberal arts colleges; a majority of graduates in this group attended one of the top 50 liberal arts colleges. And 7.1% of the graduates went to a specialized college/university. Approximately, 13.6% of the graduates attended a university not ranked in any of the ranking tables. In this regard, it could be said that most of the IBDP graduates attended internationally well-known universities or academically strong institutions.

⁶ For example, the University of Cambridge was ranked at 5th (ARWU), 2nd (QS), and 7th (The Times). The average ranking for University of Cambridge (i.e., 4.7) was allocated to students who attended University of Cambridge.

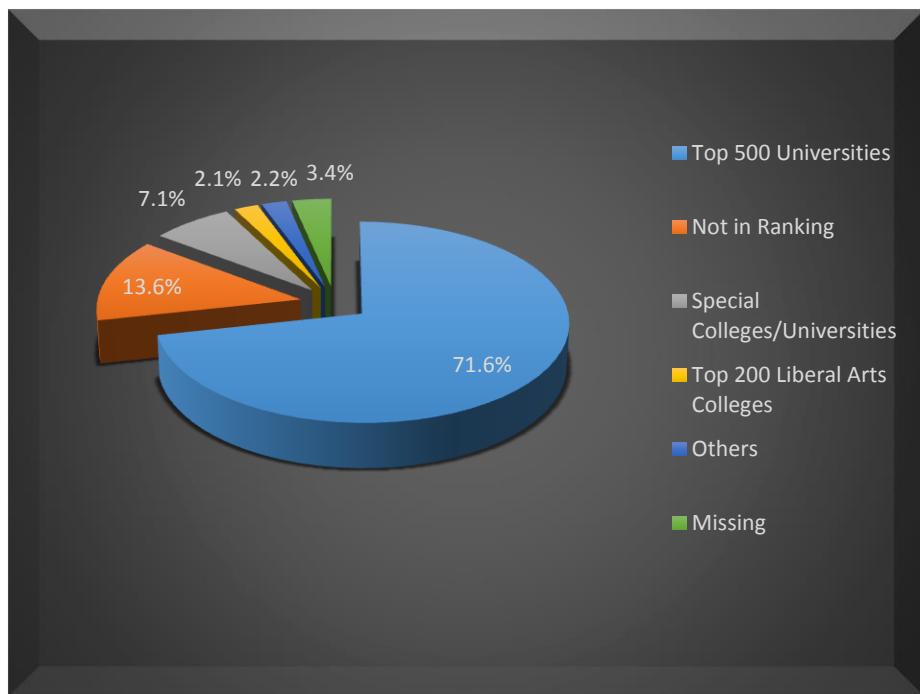


Figure 5. University destinations of IBDP graduates from 2002 to 2012 by university type and ranking

Notes: N = 1,612

Special Colleges/Universities vs. Top 500 Universities: We compared the regional destinations of two graduate groups: 1) those who were admitted to Special Colleges/Universities and 2) those who were admitted to the top 500 universities. Although we found that U.S. higher education institutes were still the most popular destination for those who chose either special colleges or top 500 universities, there were certain differences between those two groups in choosing universities by regions/countries: $\chi^2(df = 8) = 221.479$, p = .001. Among the differences, the most distinctive pattern was that for those who chose special colleges/universities, higher education institutes in Europe (excluding U.K.) were the second most popular destination (30.8%, see the figure in the left side of Figure 6) whereas for their counterparts admitted to top 500 universities, only 1.7% of them chose universities on the European continent (see the figure in the right side on page 15). Specifically, the 2 by 2 chi-square test (Top 500 vs. Special by non-European vs. European continent) indicates a significance difference: $\chi^2(1) = 147.64$, p < .001 where the odd-ratio was 39.47, suggesting that students who chose special colleges/universities were 39 times more likely to enroll in

[Students who chose special colleges/universities were 39 times more likely to enroll in institutions located in the European continent than their peers who chose top 500 universities.]

institutions located in the European continent than their peers who chose top 500 universities.

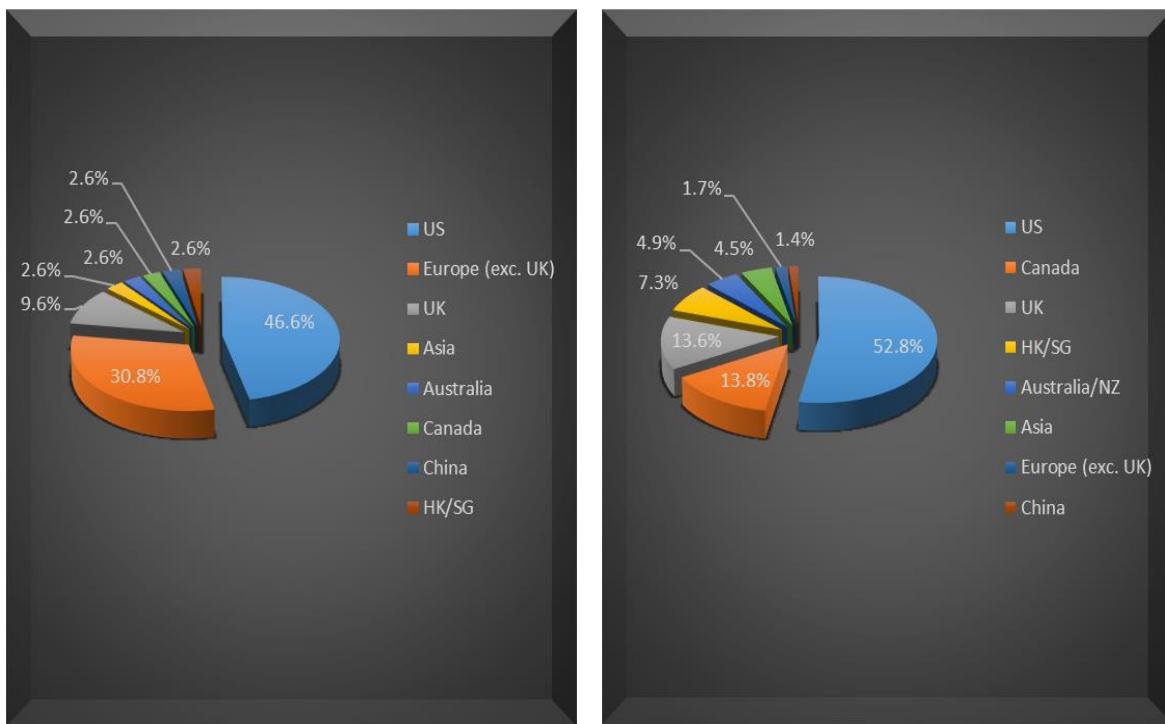


Figure 6. Special Colleges/Universities (left) vs. Top 500 Universities (right)

Notes: N = 114 for Special Colleges/Universities; N = 1,154 for Top 500 Universities

Non-Ranked Universities vs. Top 500 Universities: A similar comparison was made between the following two graduate groups: 1) IBDP graduates who were admitted to non-ranked universities and 2) IBDP graduates who were admitted to top 500 universities. For a second time, we found that U.S. higher education institutes remained the most popular destination for these two groups. However, there were certain differences between those two groups in choosing universities by regions/countries: $\chi^2 (df = 8) = 117.126, p = .001$. Among the differences, the most distinct pattern was that for those who were admitted to non-ranked universities, higher education institutes in Asia (excluding Hong Kong and Singapore) and Europe (excluding the U.K.) were the second (15.0%) and third (9.0%) most popular destination respectively (see the figure in the left side of Figure 7), whereas for their counterparts who were admitted to top 500 universities, Canada (13.8%) and the U.K. (13.6%) were the second and third most popular destination respectively (see the figure on the right side of the page below).

More specifically, another 2 by 2 chi-square test (Non-ranked vs. Top 500 by non-Asian vs. Asian universities, excluding Hong Kong and Singapore) indicates a significance difference: $\chi^2(1) = 15.19, p$

<.001 where the odd-ratio was 3.10, suggesting that students who went to non-ranked universities were 3 times more likely to enroll in institutions located in Asia (excluding Hong Kong and Singapore) than their peers chose top 500 universities. In addition, for those who were admitted to top 500 universities, Hong Kong and Singapore (7.3%) were the fourth most popular destination, which was followed by Australia and New Zealand.

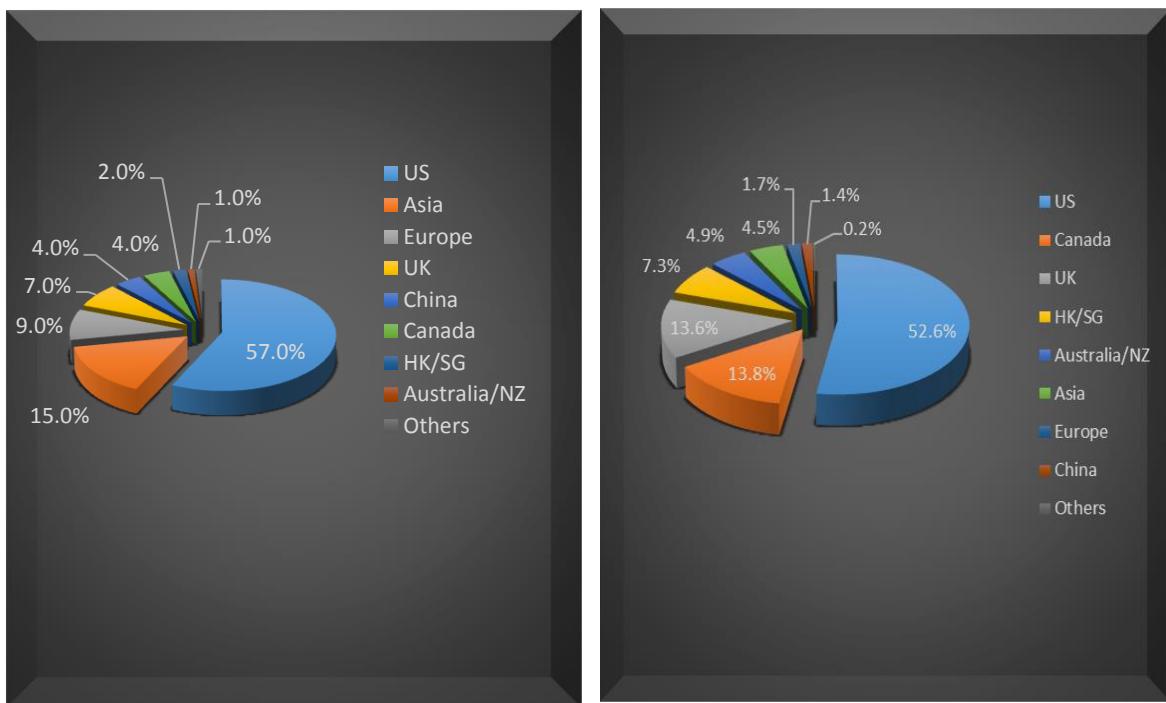


Figure 7. Non-ranked universities (left) vs. Top 500 universities (right)

Notes: N = 217 for Non-ranked universities; N = 1,154 for Top 500 Universities

Average Ranking of University Destination over 10 Years: In terms of the pattern of university rankings during the period between 2002 and 2012, we identified that there were more variation within years than between years (see Figure 8). In other words, over 10 years the average ranking of universities where IBDP graduates studied was quite stable (Mean = 107.9, Median = 71) whereas there were salient within-year variations (except 2002, for the rest of years, university rankings ranged from 3 to 475). The result of ANOVA also suggests that there was no significant change of average ranking across the 10 years: $F(10, 1143) = 1.74, p = .067$.

[Over 10 years the average ranking of universities where IBDP graduates studied was quite stable (Mean = 107.9, Median = 71).]

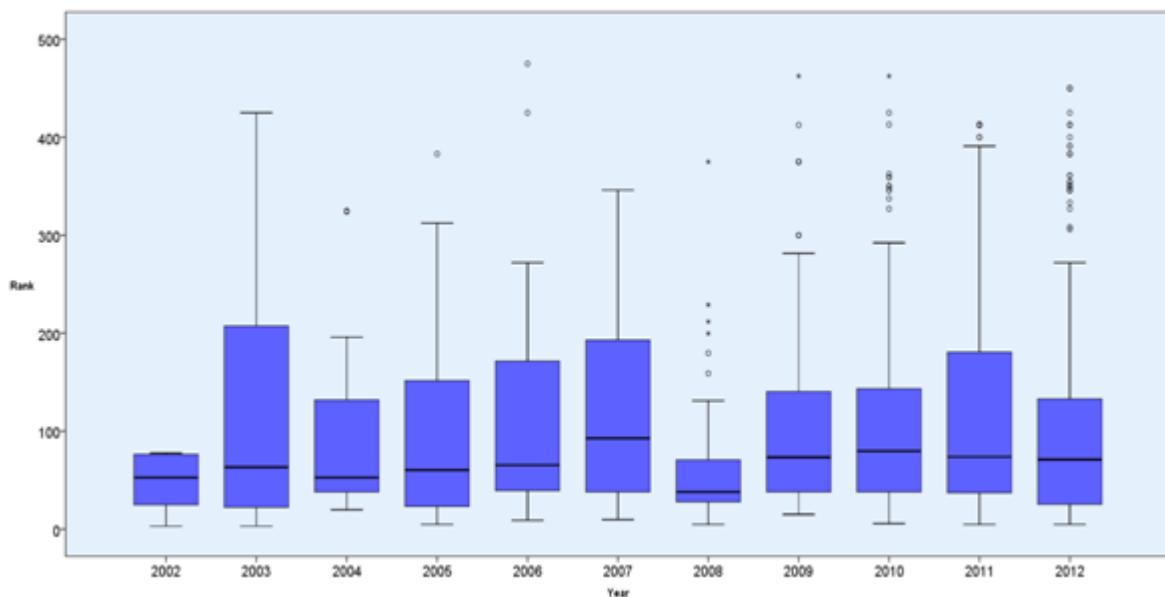


Figure 8. Average Rankings of University Destinations for 10 Years

Notes: N = 1,154 (i.e., those who attended one of the world top 500 universities)

2.1.4. SUMMARY AND IMPLICATIONS

- 1. The most popular destination for IBDP graduates' university study was the U.S., with approximately half of the IBDP graduates (51.1%) from 2002 to 2012 choosing U.S. universities. This was followed by UK (11.4%), and Canada (10.7%). A similar pattern was identified from Chinese undergraduates for their study abroad: US/Canada (28.6%) and UK (24%). However, IBDP graduates were more likely than Chinese undergraduates to study in the U.S. and less likely to study in the U.K. At the same time, for Chinese undergraduates, universities in Hong Kong or Singapore were the third most popular destination (16.2%) whereas only 5.8% of the IBDP graduates chose universities in Hong Kong or Singapore for their higher education. That is, U.S. universities were preferred by IBDP graduates whereas universities in the U.K., Hong Kong, or Singapore were less popular. There may be several reasons why the majority of IBDP graduates attended U.S. universities. First, it may simply be because IBDP graduates prefer U.S. universities, which have a very strong academic reputation irrespective of their rankings. Second, we speculate that one of the underlying reasons for such pattern of university destinations was nationality. As previously noted, the vast majority of IBDP schools in China are in the international schooling sector with an international student body. As we will demonstrate in the following section, our online survey data indicated that the majority of the IBDP graduates who studied in U.S. universities were U.S. passport holders. At the same time, however, caution should be exercised with this interpretation, because our online survey sample was

predominantly drawn from IB graduates who had completed their IBDP studies in China but were based in U.S. universities. Despite this, we propose that nationality is one of factors influencing university destination among other factors. Third, we theorize that another factor may be the growing recognition of the IBDP by top U.S. universities. We will further discuss this issue in our case study.

- **2.** Another salient pattern was that six in seven IBDP graduates chose universities in English speaking countries. Moreover, there was a greater preference among IBDP graduates to study in English speaking countries, compared with Chinese undergraduates studying abroad. This may reflect the concentration of IBDP schools in the international schooling sector operating with an English medium of instruction.
- **3.** 71.6% of IBDP graduates attended one of top 500 universities during the period between 2002 and 2012. In other words, overall, IBDP graduates were admitted to internationally reputable universities; the average ranking was 108 and the median ranking was 71. If we regard the top 200 liberal arts colleges in the U.S. as academically strong institutes, it could be said that three in four IBDP graduates attended academically-oriented higher education institutions.
- **4.** The high performance of IBDP schools in China in terms of graduates entering internationally reputable higher education institutions might be interpreted as a positive impact of the IBDP.
- **5.** We also note some more nuanced patterns of university destination through comparison between groups of graduates each choosing a different type of university. For example, IBDP graduates who chose special colleges/universities were more likely to choose higher education institutions in Europe (excluding U.K.), which was their second most popular destination (30.8%). For those who were admitted to non-ranked universities, higher education institutes in Asia (excluding Hong Kong and Singapore) and Europe (excluding the U.K.) were the second (15.0%) and third (9.0%) most popular destination respectively, whereas for their counterparts who were admitted to top 500 universities, Canada (13.8%) and the U.K. (13.6%) were the second and third most popular destination respectively. In addition, for those who were admitted to top 500 universities, Hong Kong and Singapore (7.3%) was the fourth most popular destination, which was followed by Australia and New Zealand.
- **6.** At the same time, even though a majority of their peers were admitted to internationally well-known universities, still 13.6% of the IBDP graduates were admitted to relatively unknown universities, which do not appear in any of the ranking tables.
- **7.** In terms of longitudinal trend of university destination, over the last decade there was no significant change (either increase or decrease) in IBDP graduate university destination according to average university ranking.

2.2. INVESTIGATION OF THE IMPACT OF IBDP LEARNING EXPERIENCES ON UNIVERSITY ACADEMIC PERFORMANCE

2.2.1. INTRODUCTION

Our aim in the second phase of the study was to conduct a quantitative analysis on recent IBDP graduates' perceptions and reflections of learning experiences. In particular, we focused on identifying factors surrounding IBDP learning experiences in relation to university studies as perceived by recent graduates (i.e., graduates in 2011 and 2012 who are currently enrolled in their first or second year of university study). This dataset was linked to student performance on IBDP exams (available from the IBO) and university GPA⁷ in order to further investigate the relationships among IBDP learning experiences, IBDP exams, and university GPA.⁸ Notably, in this investigation, our plan was not to compare IBDP holders with their non-IB peers. Although this would be an important analytical slice of the impact of the IBDP in China, in terms of the research feasibility of obtaining such data from university registries, this was beyond the scope of this study.⁹ Rather, the focus of the analysis was on identifying relationships among key learning experiences, IBDP exam scores, and university GPAs of IBDP graduates, which may provide an empirical basis for establishing relationships among such factors in the future.

2.2.2. DATA COLLECTION AND ANALYSIS

Data collection for the IBDP graduates' survey on university preparation took the form of template tables emailed to participating schools requesting student names of their 2011 and 2012 cohorts and their respective university destination. The two cohorts were chosen as an appropriate sample as the project targeted students with one or two years' experience of university study. This population sample was considered to be in a favorable position to reflect on the impact of the IBDP on their university preparation and transition.

⁷ We tried to contact university registries in order to obtain GPAs. However, GPA information was inaccessible due to university policies and/or state legislation. Alternatively, we had to rely on self-reported GPAs. While this would remain a limitation to some extent, methodology research papers have demonstrated that self-reported GPA of undergraduates is consistently reliable (see Cassady, 2001).

⁸ In this study, we did not focus on the completion of university study (e.g., obtaining a B.A.) of IBDP graduates. There were two reasons for this. First, IBDP graduates completion of university study has been relatively well documented by previous studies. For example, Duevel's (1999) study found that IBDP graduates who were enrolled in 12 top-tier U.S. universities had a high degree completion rate (87%) in five years or less. Second, for more practical reasons: since we targeted a cohort of recent IBDP graduates, a longitudinal tracking of their university completion was not feasible. Rather, we targeted recent IBDP graduates to gather their critical reflections on IBDP learning experiences while they are still relatively fresh in their memories and they may still be experiencing challenges during their university studies.

⁹ Previous studies have already addressed this analytical angle. For example, the recent IBO study (IB, 2010) provided elaborated comparisons between IB diploma holders and non-IB student groups in terms of academic outcome on a relatively large scale.

Over the period of three months, out of the 16 schools who provided datasets, 14 schools provided student names of their 2011 and 2012 cohorts with their respective destination. However, due to student privacy and confidentiality concerns, the remaining schools were not able to participate. The combination of the two cohorts of 2011 and 2012 graduates from 14 IBDP schools provided a population size of 862 students.

[An aggregate total of 260 student participants completed the online survey.]

The strategy employed by the research team to contact these students was to identify their email addresses by searching the student directories of university websites. This strategy was most applicable for 362 out of the 862 students attending university in the U.S., as student directories are public information on some university websites. Using this method, 192 student email addresses were identified. The remaining 170 students could not be found for two reasons: first, because they had opted for their names not to be disclosed on their university student directory or second, because their particular university chose not to display the student directory for public access in its commitment to the Family Education Rights and Privacy Act (FERPA) legislation in the U.S. Those students not attending U.S. universities were contacted using social networking methods including Facebook and LinkedIn by matching their names with their university destination on their social media profiles. As such, we invited the 192 students by sending an email containing a hyperlink to an online survey hosted on SurveyMonkey. Another 40 students were located by the social networking method. From the combination of these two methods, a total of 146 students completed the online survey.¹⁰ In addition, an email containing a hyperlink to the online survey was sent to 2011 and 2012 IBDP China graduates who were members of the IB alumni network. As a result, an additional 114 students completed the online survey. An aggregate total of 260 student participants completed the online survey.¹¹

With regard to the survey questionnaire, it included questions related to demographic information and also regarding the usefulness of IBDP learning experiences to university preparation and success.

¹⁰ We provided an Amazon coupon (10 US\$) for each respondent to increase the rate of responses. The response rate was 62.9%.

¹¹ Notably, of these 260 student participants, 151 students were matched with the corresponding IBDP exam score from the data set provided by the IBO office in Singapore, as having completed the IBDP. The remaining 109 students did not have a corresponding IB exam score due to either two possibilities namely: one, they were awarded the IB certificate rather than the IBDP or two, they entered university through channels other than IBDP (e.g., Subject scores or other programs).

Questions that focused specifically on non-cognitive aspects of the Learner Profile¹² consisted of items developed by the research team, as well as question items from previous studies on the IBDP (Coates, Rosicka, & MacMahon-Ball., 2007; IB, 2007b; Jenkins, 2003).

Before going further to the main analysis, based on descriptive analysis, we first addressed missing values; the missing values of a vast majority of variables were less than 6% while those of a few variables showed relatively high missing values (e.g., 25.8% of missing values in the variable of cohort).¹³ To manage and handle these missing values, we used full-information maximum-likelihood (FIML) estimation to address the missing values. FIML has been identified to be efficient for incomplete data in that FIML estimates are less biased than listwise deletion or pairwise deletion (Little & Rubin, 1989; Graham, 2009; Schafer & Olsen, 1998; Muthén, Kaplan, & Hollis, 1987). Following this, we used a series of descriptive statistical analyses, CFA, and SEM.¹⁴

2.2.3. RESULTS: DESCRIPTIVE STATISTICAL ANALYSIS

Descriptive Analysis of Demographic Information: The demographic information of the survey participants is shown in Table 1. , and others were admitted to liberal arts colleges (9.2%), special colleges (3.4%), and non-ranked universities (10.3%). The overall pattern of types of university destination was similar to that of IBDP graduates over the last 10 years (see the previous section).

With regards to the nationality of the IBDP graduates, the majority of them were either U.S. and Western European country passport holders (60.8%) or non-Chinese nationals of other Asian countries (28.1%). The most chosen disciplines were professions and applied sciences for example accountancy or physics (37.5%), social sciences including economics (15.7%), and humanities such as geography (7.7%).

[Most parents of the IBDP graduates had a 4-year university degree, a Master's degree, or a doctoral degree (86.6% for fathers and 70.4% for mothers).]

¹² The Learner Profile is defined by the IB as “a set of [ten] learning outcomes for the 21st century. This includes balanced, caring, communicators, inquirers, knowledgeable, open-minded, principled, reflective, risk-takers, and thinkers.

¹³ Also, two variables related to the IB Learner Profile indicated 49.2% of missing values, respectively and systematically. As such, the two variables on the IB Learner Profile were not included for analysis in that the missing rate was not just only high, but also they were systematically missing.

¹⁴ For SEM, originally we planned to conduct multi-group structural equation modeling (SEM) analysis. However, the model fit did not support this kind of analysis. For multilevel SEM, since we received data from 14 schools, the sample size of the upper unit (i.e., school level) was not adequate to support multilevel SEM (Muthén & Muthén, 1998-2010). Therefore, in this report we provide a general SEM analysis.

In terms of family background, most parents of the IBDP graduates had a 4-year university degree, a Master's degree, or a doctoral degree (86.6% for fathers and 70.4% for mothers). While the household income of the students was distributed across the sub-scales, approximately 68% of the participants were from relatively high-income households (i.e., annual income > 80,000 USD) and 22.3% of the participants were from wealthy families (i.e., annual income > 180,000 USD).

Table 1. Demographic information of the survey participants.

	<i>Frequency</i>	<i>Percent</i>
Cohort		
2011	93	35.8%
2012	100	38.5%
Missing values	67	25.8%
University Ranking/Type		
Top 500 universities	195	75.0%
Liberal arts college	24	9.2%
Special college	9	3.5%
Out of ranking	27	10.4%
Missing values	5	1.9%
Nationality		
Asia	73	28.1%
West Europe or North America	158	60.8%
Others (Africa, South America, East Europe)	21	8.1%
Combination	8	3.1%
Missing values	0	0%
Discipline		
Humanities	20	7.7%
Social sciences	41	15.8%
Natural sciences	24	9.2%
Formal sciences	19	7.3%
Professions and applied sciences	98	37.7%
Combination	24	9.2%
Missing values	34	13.1%
Family Background		
<i>Father's education</i>		
High school or lower	17	6.5%
2-year university	12	4.6%
4-year university	81	31.2%
Master's degree	98	37.7%
Doctoral degree	46	17.7%
Missing values	6	2.3%
<i>Mother's education</i>		
High school or lower	51	19.6%
2-year university	22	8.5%

4-year university	94	36.2%
Master's degree	75	28.8%
Doctoral degree	14	5.4%
Missing values	4	1.5%
Household annual income (in USD)		
<40,000	52	20.0%
40,000-60,000	9	3.5%
60,000-80,000	22	8.5%
80,000-100,000	26	10.0%
100,000-120,000	47	18.1%
140,000-160,000	33	12.7%
160,000-180,000	13	5.0%
>180,000	58	22.3%
Missing values	0	0%

Note: N= 260

IB Exam Score, University Ranking, and GPA: The descriptive statistics of the online survey are presented in Table 2. The average IBDP exam score of the students was 35.4 out of 45, which is higher than the average score of IBDP graduates around the world (i.e., around 30 points over the last decade)¹⁵ as well as all IBDP graduates from China in 2011 and 2012 (Mean = 31.8, SD = 6.6, N = 2,680).¹⁶ In this regard, our survey participants were relatively high achievers. This was reflected in our interpretation of the findings. According to Van Loo *et al.* (2004), IBDP graduates with a score between 28 and 36 points are qualified to be admitted to a ‘good’ university and IBDP graduates with a score higher than 37 are qualified to be admitted to a ‘prestigious’ university.

Replicating this finding, the median university ranking of higher education institutes to which the survey participants were admitted was 42 out of the top 500 universities in the world, indicating that the majority of the students went to internationally well-known universities.¹⁷ The median GPA of

[The median university ranking of higher education institutes to which the survey participants were admitted was 42 out of the top 500 universities in the world, indicating that the majority of the students went to internationally well-known universities.]

¹⁵ See the IB document titled “Understanding the IB Diploma Programme scores.” Retrieved from www.ibo.org/recognition/.../AssessmentScoresOnePager1.8.pdf

¹⁶ To be awarded the IB diploma, a minimum of 24 points out of 45 should be achieved..

¹⁷ We focused more on median than mean, given that the distribution of the university ranking was positively skewed. The mean university ranking of higher education institutes to which the survey participants were admitted was 88 out of the top 500 universities in the world.

the students in college was 88/100.¹⁸

Table 2. IB Exam Score, University Ranking, and GPA

	Mean	Median	Std. Deviation	Minimum	Maximum
IB exam score (out of 45)	35.36 (out of 45)	35.00	5.01	20	45
University ranking (out of 500)	88.04 (out of 500)	41.85	94.48	3	413
GPA (out of 100)	86.05 (out of 100)	87.50	11.48	45	100

Note: N = 194 for University Ranking, N = 232 for GPA, and N = 151 for IB Exam

IB Learning Experiences: Based on the adoption of existing survey instruments on IBDP (Coates *et al.*, 2007; IB Research Unit at the University of Bath, 2007; Jenkins, 2003) and our own development of survey items, we measured several key factors related to IBDP learning experiences under the headings of IBDP Curriculum (7 items), Preparation for University Study (6 items), and IB Learner Profile (10 items). All these items were measured using a 6-point Likert scale as below (see Appendix 1 for the entire survey questionnaire).

¹⁸ Since different universities utilized different scales of GPA, we standardized them using percentile. The distribution of GPA was negatively skewed.

IBDP Curriculum

*8. What level of importance would you place on these factors in helping to make your university study successful?

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
A broad curriculum with subjects in 6 different areas	<input type="radio"/>					
Studying at least 3 subjects in depth	<input type="radio"/>					
Spreading all subjects over 2 years	<input type="radio"/>					
The use of a range of assessment strategies	<input type="radio"/>					
A 100-hour course on the theory of knowledge	<input type="radio"/>					
A 4000-word extended essay	<input type="radio"/>					
150 hours of creative, physical and community service activities	<input type="radio"/>					

Figure 9. Survey questions on IBDP curriculum

Preparation for University Study

*9. Do you believe that because of the IBDP:

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
You have had an easier transition to university life	<input type="radio"/>					
You are more capable of independent research	<input type="radio"/>					
You have better written communication skills	<input type="radio"/>					
You have better oral communication skills	<input type="radio"/>					
You are more active in university outside the lecture theater or lab	<input type="radio"/>					
You are a better problem solver	<input type="radio"/>					

Figure 10. Survey questions on IBDP experience of preparation for university study

IB Learner Profile

*11. To what extent do you agree or disagree that IBDP prepared you for university in terms of:

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
Developing a natural curiosity	<input type="radio"/>					
Acquiring knowledge across a broad range of disciplines	<input type="radio"/>					
Thinking critically and creatively	<input type="radio"/>					
Communicating effectively with others in more than 1 language or in a variety of modes	<input type="radio"/>					
Acting with integrity, justice and respect for the dignity of other people	<input type="radio"/>					
Understanding your own culture but being also open to others	<input type="radio"/>					
Acting to make a positive difference in the lives of others and to the environment	<input type="radio"/>					
Approaching uncertainty with courage to explore new roles, ideas and strategies	<input type="radio"/>					
Understanding the importance of intellectual, physical and emotional balance for personal well-being	<input type="radio"/>					
Assessing and understanding strengths and limitations to support learning and personal development	<input type="radio"/>					

Figure 11. Survey questions on IB Learner Profile

We checked the validity of the latent constructs based on our detection of factor structures with CFA (see Appendix 2). The overall model fit of the CFA measurement model was acceptable: CFI = .912 and RMSEA = .075. As Appendix 1 shows, all the indicator variables loaded significantly on their respective factors. A majority of the indicator variables showed excellent factor loadings (i.e., higher than .70) and all of the standardized coefficients indicated good factor loadings (i.e., higher than .50) (Tabachnick & Fidell, 2007). In terms of reliability, Cronbach's alpha indicated that three of the four constructs' reliability was confirmed. However, the construct of Core Components showed a relatively weak reliability (Cronbach's α = .55) as presented in Table 3. Cronbach's alpha coefficient (.55) indicated a moderate level of reliability. Although moderate, we kept the latent construct in the model since it has a solid validity. Also, we kept the construct in that the moderate level coefficient

appears to be attributable to the relatively small number of items measured on Core Components (3 items). Cronbach alpha is not just a function of international consistency but also is determined by the number of measured items (Cronbach, 1951). That is, it can be artificially deflated when there are a fewer number of items (McIver & Carmines, 1981).

In sum, we confirmed four factors from the survey questionnaire above, which were named IBDP Subject Requirements (i.e., the first 4 items in IBDP Curriculum, see Figure 9), IBDP Core Components¹⁹ (the remaining 3 items in IBDP Curriculum, see Figure 9), University Preparation (i.e., 6 items as one factor structure, see Figure 10), and IB Learner Profile focusing on non-cognitive dimensions (i.e., 5 items as one factor structure, see Table 3 and Figure 11).²⁰ We further defined the aforementioned constructs as follows. IBDP ‘Subject Requirements’ referred to key curriculum and assessment requirements on IBDP subjects. IBDP Core Components were defined as unique learning components of the IBDP consisting of the Extended Essay, Theory of Knowledge (TOK), and Creativity, Action, Service (CAS). University Preparation included students’ perceptions of their capacity on key skills for university study such as communication, problem solving, and independent research. The construct of IB Learner Profile incorporated five learning outcomes focusing on non-cognitive IB attributes such as balanced, risk-takers, caring, and open-minded.

As detailed in Table 3, for the measure of Subject Requirements, the mean score was 4.67 (out of 6) and the standard deviation was 1.29, suggesting that the survey participants perceived that Subject Requirements were slightly or moderately helpful for the success of their university preparation. The Core Components had a mean score of 3.94 (out of 6) and standard deviation of 1.52, indicating that the Core Components were slightly helpful for their university preparation. For the measure of University Preparation, the mean score was 4.73 (out of 6) and the standard deviation was 1.20., suggesting that the survey participants viewed IBDP experiences as slightly to moderately important in their preparation for university study by providing key skills such as independent research, communication, and problem solving. For the measure of IB Learner Profile with a focus of non-

¹⁹ In this report, we refer to Creativity, Action, Service (CAS), Extended Essay (EE) and Theory of Knowledge (TOK) as the ‘Core Components’.

²⁰ For the IB Learner Profile, initially we used 7 out of the 10 question items for our CFA. The reason was because the seven items were consistently related to non-cognitive dimensions of learning, which was our main focus of analysis in terms of university preparation. Later, we noticed that two more items had 49.2% of missing values, respectively and systematically. We did not include these two items in our CFA because the two items’ missing rate was not only high, but also were systematically missing. As a result, the five items included in the final SEM analysis were: 1) communicating effectively with others, 2) acting with integrity, justice, and respect for the dignity of other people, 3) understanding your own culture but being also open to others, 4) acting to make a positive difference in the lives of others, and 5) approaching uncertainty with courage with new roles, ideas, and strategies.

cognitive dimensions, the mean score was 4.62 (out of 6) and the standard deviation was 1.11. Likewise, on average, the participants perceived that learning experiences related to the IB Learner Profile focusing on non-cognitive domains were slightly to moderately helpful for their university studies preparation.

Table 3. Four factors of IBDP curriculum, university preparation, and IB Learner Profile

	Mean	Std. Deviation
IBDP Subject Requirements (Cronbach's $\alpha = .79$)	4.67	1.29
Broad Curriculum	4.59	1.40
Three Subject In-depth	5.00	1.06
Spreading Subjects Over 2 Years	4.38	1.40
Range of Assessment Strategies	4.69	1.30
IBDP Core Components (Cronbach's $\alpha = .55$)	3.94	1.52
100 hours Theory of Knowledge	3.55	1.64
Extended Essay	3.94	1.53
Community Service Activities	4.33	1.39
University Preparation (Cronbach's $\alpha = .91$)	4.73	1.20
Question 1	4.89	1.29
Question 2	4.90	1.12
Question 3	4.87	1.17
Question 4	4.68	1.26
Question 5	4.41	1.29
Question 6	4.61	1.09
IB Learner Profile Focusing on Non-cognitive domains (Cronbach's $\alpha = .91$)	4.62	1.11
Question 4	4.85	1.04
Question 5	4.46	1.27
Question 6	4.63	1.21
Question 7	4.53	1.04
Question 8	4.61	1.01

Notes: N= 151. The % of missing values varied across the items ranging from 3.5% to 6.2%. On average, 4.9% of values of the items had missing values.

2.2.4. RESULTS: STRUCTURAL EQUATION MODELING (SEM)

In this section, before presenting SEM results, we first provide our analytical model illustrated in Figure 12. A summary of our general understanding about relationships among key variables such as IBDP exam scores, university preparation, university ranking, and GPA is presented below in Figure 12.

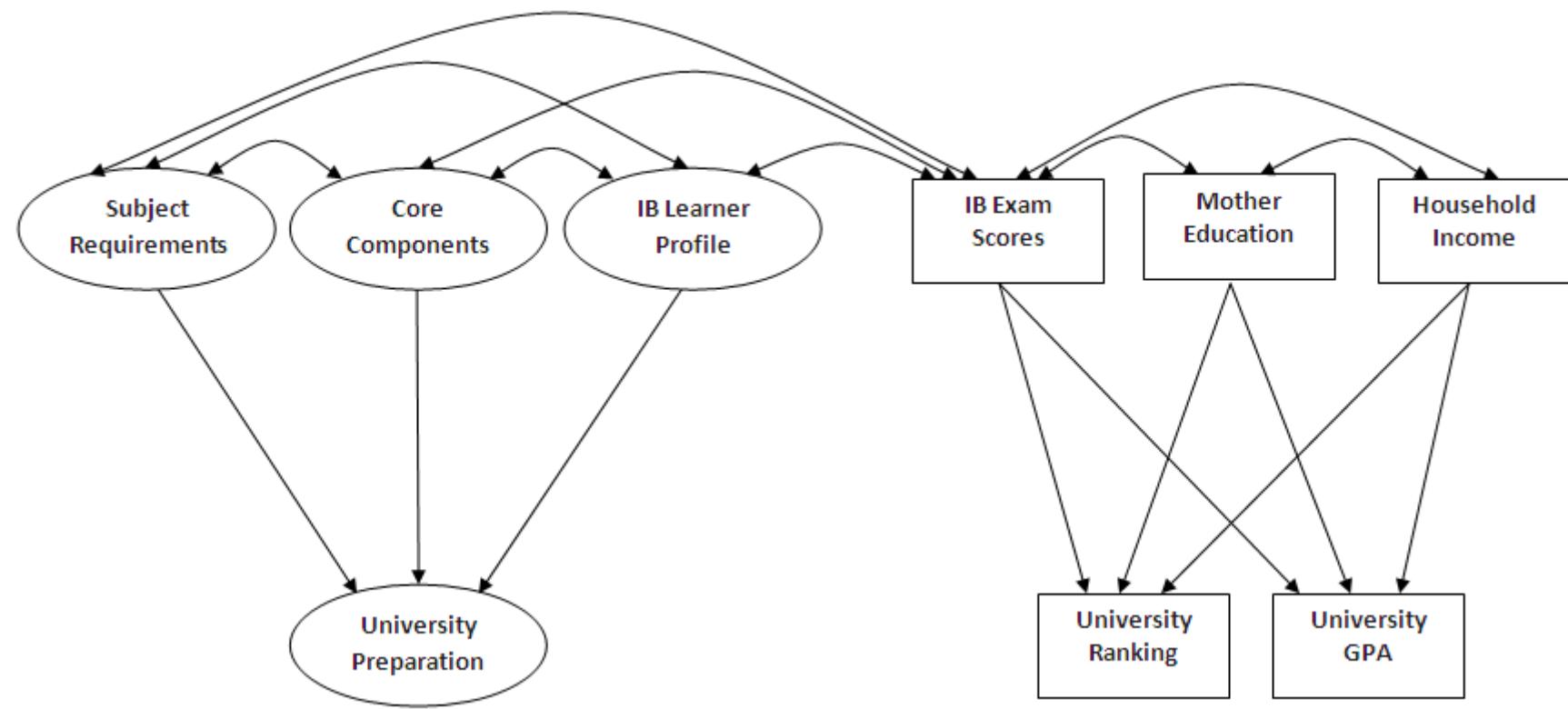


Figure 12. Proposed Structural Model for SEM Analysis

Notes: Error terms and indicator variables of latent constructs were omitted for simplicity of the model presentation.

First, we assumed that the three constructs (i.e., Subject Requirements, Core Components, and IB Learner Profile) would be correlated with IBDP exam scores, given the content of the survey items of those three constructs. Additionally, the latent variables of Subject Requirements and Core Components were considered to be related to IBDP exam scores as the constructs measured student perceptions about the relative importance of the structure of the IBDP curriculum. For instance, we expected that the value that students placed on the Extended Essay would be associated with overall academic performance in the IBDP. Similarly, we assumed that the construct of IB Learner Profile with a focus of non-cognitive domains would be associated with IBDP exam scores even though the construct is aligned with affective, moral, and social dimensions.²¹

Second, for University Preparation, we assumed that the value the students placed on the latent constructs of Subject Requirements, Core Components and IB Learner Profile would predict of how prepared they had been for University given that the factor of University Preparation was constructed with survey items highlighting communication skills, independent research skills, and problem solving skills.

Third, with respect to preparation for university assessments, we predicted that IBDP exam scores would have a relation to university GPA. For example, we predicted that high achievers in IBDP exams would attain high GPAs at university.²² We also assumed that IBDP exam scores would be critical to university ranking, given that high achievers in IBDP exams would have a better chance to attend high-ranking universities.

Alongside this hypothesized model, we assumed that individual students' family backgrounds such as the level of mother's education and household income would be related to university ranking and GPA. As such, we included these demographic variables representing parts of family socio-economic statistics as control variables in the model.

²¹ Indeed, this assumption was later reaffirmed by our interview illuminating that the majority of teachers reported trying to integrate the Learner Profile into their pedagogical practices. That is to say, teachers aimed to nurture Learner Profile traits, including those related to inter-cultural understanding, through course content and method of delivery.

²² However, we note that this assumption might not be supported because GPA is a within-university measure. That is, for example, an IBPD exam high achiever who attends a very competitive university may get a lower GPA than an IBDP exam lower achiever attending a less competitive university, whereas the IBDP exam lower achiever could get a high GPA relatively easily. Despite this, we assumed that there would be a positive or negative association between IBDP exam scores and GPA.

Overall, the model fit of the proposed model was marginally acceptable: $\chi^2 = 528.7$, $df = 262$, $p = .000$, CFI = .904, RMSEA = .063. Specifically, we relied more on standard cutoff recommendations for the RMSEA and CFI (Fan & Sivo, 2007) rather than chi-square statistic, which is sensitive to sample size (Bentler, 1990).²³

As illustrated in Figure 13, there were significant correlations among Subject Requirements, Core Components, and IB Learner Profile on non-cognitive dimensions, as expected.

Furthermore, both Subject Requirements and IB Learner Profiles were positively associated with students' perception of university preparation, whereas Core Components were not significantly associated with university preparation. More specific explanations on these findings are offered as follows. First, Subject Requirements significantly predicted University Preparation (.20*).²⁴ An explanation for this positive response is based on the content of the survey items of Subject Requirements: 1) broad curriculum with subjects in 6 different areas, 2) studying at least 3 subjects in depth, 3) spreading all subjects over 2 years, and 4) the use of a range of assessment strategies. Indeed, interviewees in our case study reported that experience of the rigor of Subject Requirements was conducive to helping students "coast" through the first year of university, although some participants reported that students often struggled with the heavy workload of the Subject Requirements. Moreover, there was a perception among students that IBDP required significantly more work than other educational programs, such as A-Levels and the AP Program. Finally, this positive relationship is also supported by descriptive statistics in Table 3 indicating that IBDP graduates rated Subject Requirements as slightly to moderately helpful for University Preparation.

Second, IB Learner Profile, focusing on non-cognitive domains, was significantly predictive of students' university preparation given that the standardized path coefficient indicated a large effect size (.53***).²⁵ This was a reasonable finding given that IB Learner Profile on non-cognitive domains highlights the well-rounded development of students (e.g., integrity, inter-cultural understanding,

[Both Subject Requirements and IB Learner Profiles were positively associated with students' perception of university preparation, whereas Core Components were not significantly associated with university preparation.]

²³ Notably, we first examined both a CFA measurement model and another measurement, including all the observed variables such as IB exam scores, in testing the proposed model. The CFA measurement model only including latent constructs indicated an acceptable model fit (CFI = .912 and RMSEA = .075). Another measurement model also showed an acceptable model fit (CFI = .905 and RMSEA = .065). Based on this identification of measurement models, we further tested the proposed SEM.

²⁴ 20* refers to a standardized path coefficient at the level of $p < .05$.

²⁵ See Kline (2005) for interpretation about standardized path coefficients.

and communication skills), which is an integral part of university preparation. Accordingly, case-study interviewees reported that Learner Profile traits were central to the IB educational philosophy and were, in theory, highly beneficial to university transition. Notably, descriptive statistics in Table 3 also supports this finding given that IB Learner Profile was regarded by IBDP graduates as having a slightly to moderately positive effect on University Preparation.

Third, although the relationship between Core Components and University Preparation was positive, this relationship was not statistically significant. It is worth mentioning that descriptive statistics in Table 3 also indicate that Core Components were considered by IBDP graduates to only be slightly helpful for University Preparation, measuring student perceptions of the IBDP to help them to succeed in university; the mean of Core Components was 3.94, lower than that of Subject Requirements (4.67) and that of IB Learner Profile (4.62) on a 6-point Likert scale. One plausible explanation would be that students' experience of Core Components such as TOK may be not directly influential on their perception of university preparation. Another possible reason from our follow-up case study interview data indicated that some high-achieving IBDP students tended to neglect the importance and value of CAS, one of the main parts of Core Components. This will be further discussed in the qualitative study section.

In addition, the SEM analysis revealed that IBDP exam score was predictive of both the ranking of universities where the IBDP graduates studied (.35***), and their university GPA (.35***) with the medium level of effect size of standardized path coefficients. This suggests that high achievers in IBDP exams entered universities with high ranking and that they also performed well in their university studies. This also indicated that students' potential academic ability, as demonstrated in university destination by ranking and university study, could be well predicted by IBDP exam scores. Additionally, it is worth mentioning that even when we controlled for students' family backgrounds such as mother education and household income, the predictive power of IB exam scores on both university ranking and GPA remained significant.

Finally, we wish to note a limitation in the SEM analysis reported above. We suspected that there could be potentially significant relationships between some of our variables (e.g.,

*[The SEM analysis revealed that IBDP exam score was predictive of both the ranking of universities where the IBDP graduates studied (.35***), and their university GPA (.35***) with the medium level of effect size of standardized path coefficients.]*

IB exam and Subject Requirements) in the model but this turned out to be not significant due to the relatively small sample size ($N = 151$). Indeed, when we estimated the required sample size to achieve statistical power of .80 for the current model by specifying a null and alternative value of RMSEA fit index (i.e., $\varepsilon_0 = .05$ and $\varepsilon_a = .063$) at the level of $\alpha=.05$ (MacCallum, Browne, & Sugawara, 1996), the required sample size turned out to be 250. This implies that the relationship between the aforementioned variables might be significant at the level of $\alpha =.05$, if the model would have included more students than the sample students in the final analysis.

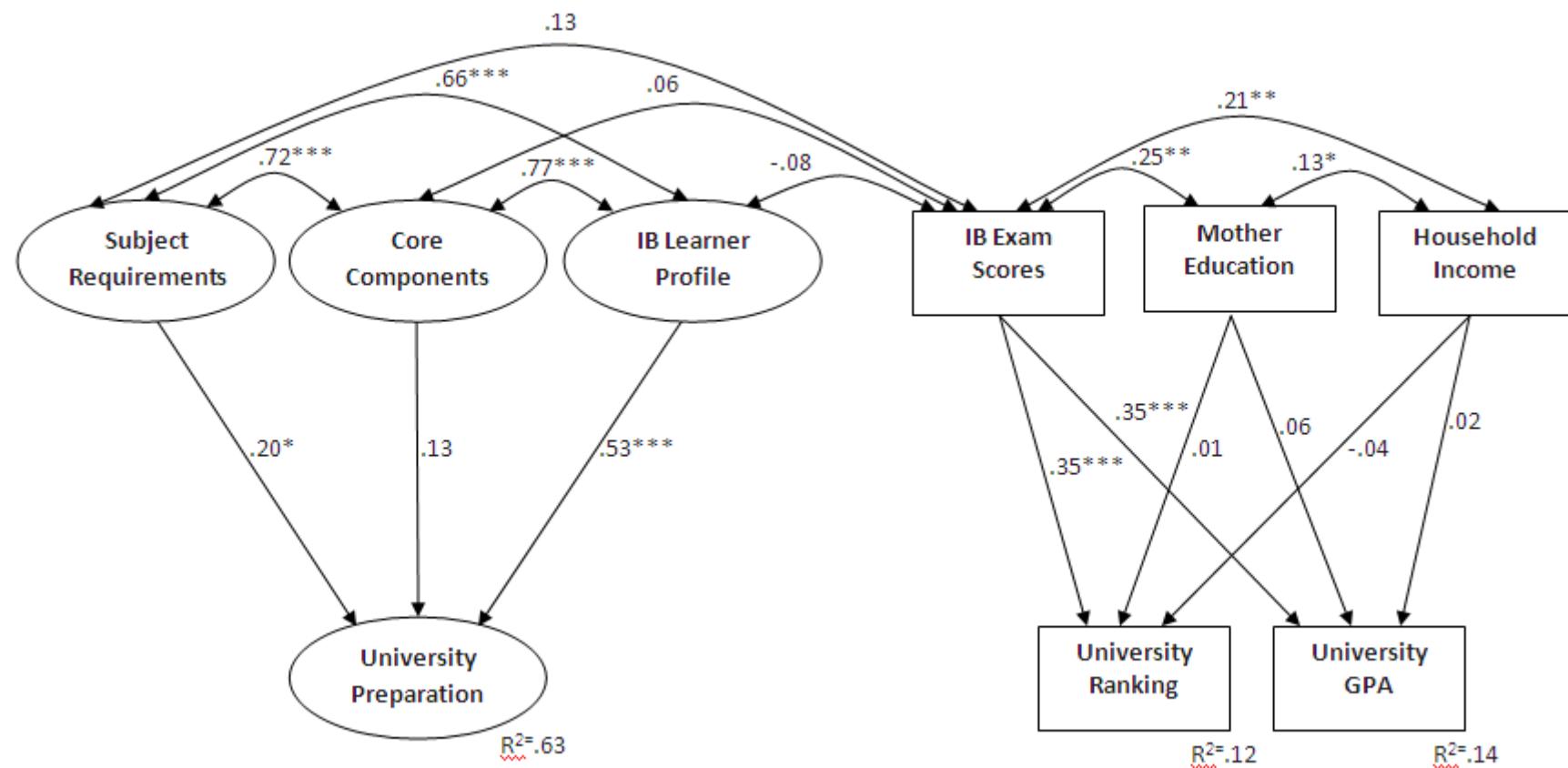


Figure 13. SEM Analysis

Notes: N = 151 students taking IBDP.

Error terms and indicator variables of latent constructs were omitted for simplicity of the model presentation.

The solid arrows indicate statistically significant relationships whereas the dotted lines do not. * $p < .05$, ** $p < .01$, *** $p < .001$.

2.2.5. SUMMARY AND IMPLICATIONS

- **1.** The overall pattern of type of university destinations of the 260 survey participants was similar to that of IBDP graduates over 10 years: the majority of them (74.7%) were admitted to one of the top 500 universities in the world.
- **2.** According to the survey data analysis, the nationality of IBDP graduates appeared to be associated with their choice of university destinations, given that there are were high correlations between IBDP graduate nationalities and countries of IBDP graduate university destinations. Specifically, the majority of the IBDP graduates who studied in U.S. universities were U.S. passport holders. However, caution should be exercised when interpreting this result, because our sampling was predominantly based on U.S. universities. As our interpretation, we find that on the one hand nationality was a factor influencing university destination. On the other hand, we speculate that there are other factors which shape the pattern of IBDP graduates university destination. These are discussed in the next section of the report.
- **3.** A majority of the survey participants (68%) were from relatively high-income households (i.e., annual income > 80,000 USD) and 22% of the participants were from wealthy families (i.e., annual income > 180,000 USD).
- **4.** The quantitative analysis showed a perception among IBDP graduates that Subject Requirements and the latent construct of IB Learner Profile had significantly positive relationships with University Preparation, measuring student perceptions of the IBDP to help them to succeed in university. However, the descriptive statistics indicated that IBDP graduates rated Core Components as only slightly helpful for University Preparation and SEM analysis did not find a statistically significant relationship between Core Components and University Preparation. Our case-study findings shed light on this by revealing that while aspects of the IBDP are conducive to university preparation, there remain significant challenges to successful program implementation in the context of IBDP schools in China.
- **5.** Finally, the SEM analysis indicates that IBDP exam score was a strong predictor of university ranking—i.e., higher IBDP exam scores promoted IBDP graduate admission to higher ranked universities, when we controlled for family backgrounds. Additionally, IBDP exam score was a strong predictor of GPA suggesting that higher performance in IBDP exams is positively associated with academic success in university studies during freshmen and sophomore years.

3. QUALITATIVE CASE STUDY

3.1. INTRODUCTION

To expand and deepen the findings of previous research²⁶ and our quantitative data analysis, in 2013 we conducted a multi-site case study of five IBDP schools in China, collaboratively identified by our research team and the IBO office in Singapore. Our aim was to seek more elaborated explanations on how and why particular learning experiences were perceived as helpful for university preparation and success by current IBDP students, headteachers, teachers, and coordinators in these selected IBDP schools in China.

3.2. DATA COLLECTION AND ANALYSIS

3.2.1. SELECTION OF THE CASE SCHOOLS

The case study schools were selected based on their commonality. Firstly, each of the schools was relatively high achieving. For example, all of the participating schools attained significantly high averaged IBDP exam scores in 2011 and 2012 that were above 34.5, which was 4.5 points above the average IBDP exam score of IBDP graduates around the world (i.e. 30 points over the last decade, see IB, 2012b). Another commonality of these five schools was that they were DP-only schools. Given research showing different characteristics of IB schools in terms of whether or not they have a full continuum of IB programs (Hallinger, Walker, & Lee, 2010), we believe that there is a certain level of homogeneity among these DP-only schools in terms of curriculum implementation. Finally, all of the schools were located in metropolitan cities in China.

At the same time, in our school selection, we also considered diversity in terms of school size and IBDP cohort size in order to chart some possible variations across the schools. As illustrated in Table 4, some noticeable differences can be summarized as

[All of the participating schools attained significantly high averaged IBDP exam scores in 2011 and 2012 that were above 34.5, which was 4.5 points above the average IBDP exam score of IBDP graduates around the world (i.e. 30 points over the last decade).]

²⁶ Regarding the IBDP learning experiences in relation to student preparation for university study, Taylor and Porath's (2006) case study of two public schools in Canada provides an interesting finding that IBDP graduates perceive the program as addressing a wide range of topics and encouraging them to think critically.

follows. In terms of school size, School 3 had the smallest student population while Schools 1 and 3 were relatively larger in student body. Schools 1 and 4 were schools with medium-sized student populations. The number of IBDP graduates in 2011 and 2012 cohorts generally accounted for one tenth of their total student population. Except School 5 which had a comparatively small proportion of IBDP graduates in 2011 and 2012 relative to its size because its students mainly participated in the AP program, which the school offered in parallel with the IBDP.

Table 4. General information of the case schools

School Name	School Size (Student population)	No. of IBDP Graduates in 2011-2012 Cohorts
School 1	>1,000	>50
School 2	>2,000	>200
School 3	>500	>50
School 4	>2,000	>200
School 5	>4,000	>200

Note: To anonymise the schools, we provide only approximate information about school size. Other information such as 'year founded' have been purposely excluded

3.2.2. INTERVIEW DATA COLLECTION

We collected data from interviews with administrators, teachers, and students in the IBDP program. In addition, key school documents from the five schools were collected for supplementary data purposes. For gathering interview data, in total, 27 teachers and administrators were interviewed. 17 students were also selected to be interviewed. The administrators, comprising headteachers and IBDP coordinators, were individually interviewed while the teachers and students were interviewed as separate focus groups. This approach generated two-fold advantages—i.e. while individual interviews with key administrators secured enough time to draw key information related to pedagogical issues for IBDP student university preparation, focus group interviews enabled teachers and students to share their common teaching and learning experiences related to the IBDP for university preparation.

[For gathering interview data, in total, 27 teachers and administrators were interviewed. 17 students were also selected to be interviewed.]

The interview protocol was based on the quantitative results from the IBDP schools survey. The interview protocol consisted of five parts (see Appendix 4 for the interview protocol):

- Introduction
- Components of the IBDP Curriculum and University Transition
- IB Learner Profile and Pedagogy (for teachers)
- Private Tutoring²⁷
- Teaching Experience (for teachers)

Each part included three to six key interview questions tailored for staff members and students, respectively. This semi-structured interview protocol focused on perceptions of IBDP learning experiences and its impact on university preparation and transition. Because we conducted similar interview procedures with a standardized protocol, this iterative process of data collection functioned as a constant comparative method (Corbin & Strauss, 1998) while the semi-structured design also enabled participants to elaborate on their answers or to highlight issues not thought of by the interviewers.

For all interviews, at least two interviewers were involved. The underlying purpose of maintaining two interviewers was to ensure the coverage of all core issues, as single interviewers may sometimes digress from key issues and may neglect to ask some interview questions. Additionally, the approach allowed one interviewer to generate impromptu but important interview questions while the other interviewer kept to the interview protocol. All interviews were audio recorded with the consent of participants.

3.2.3. ANALYTICAL STRATEGIES

Qualitative Data Analysis: After completing interviews with the first two schools (i.e. School 2 and School 3), we started looking for codes and themes related to our research. We developed a coding scheme based on patterns emerging from the interviews and the results from the IB survey. Table 5

²⁷ In our qualitative case study, there was an emerging theme: private tutoring. Consistent with the recently growing literature on the effect of shadow education in East Asia (Bray & Lykins, 2012), we identified a number of narratives on the effect of private tutoring on IBDP exam results. Indeed, there is a growing number of private tutoring centers in major Chinese cities (e.g., Beijing and Shanghai), which targets students taking international education programs, including the IB. For some examples about such private tutoring centers in China, see <http://tutorsinchina.com/>

presents 38 pattern codes in terms of Asian students (2 codes), Core Components (6 codes), China context (5 codes), Curriculum (4 codes), University recognition (2 codes), Learner Profile (4 codes), Pedagogy (3 codes), Private tutoring (4 codes), University destination (3 codes), and University transition (5 codes), that we developed for interview data coding. That is, we reduced large amounts of our interview data into a smaller number of analytical units based on similar themes (Miles & Huberman, 1994). This helped us to generate an elaborated thematic network map (Attride-Stirling, 2001) that visualizes complex but clear relationships among themes (see Appendix 5 and Figure 15).

Additionally, several efforts were made to address validity and reliability issues in our qualitative data analysis. Each of the interviewers coded the data independently and then checked the data coding with a partner. To better ensure coding reliability, inter-rater reliability (79%) was checked with 15 randomly selected interview files. By sharing the interview transcripts, we had the opportunity to discuss and confer about our interpretations of the meanings of the participant's responses. This feedback-solicitation process was significantly important for accommodating alternative interpretations of the same transcript, contributing to a better understanding of seemingly discrepant statements. Finally, all data were then analyzed using the NVivo program (NVivo 10), qualitative data analysis software. Additionally, Netminer 3, social network analysis software, was utilized for visualizing the thematic network.

Table 5. A List of Pattern Codings and Definition of Themes

Asian students
Asian: assessment focus
- Asian students generally have a strong socio-cultural schooling work ethic and an emphasis on achieving high grades in assessments.
Asian: lack analysis/critical thinking/communication skills
- Asian students initially struggle with certain skills including analysis, critical thinking, and communication.
Core components
CAS: not prioritized
- Due to difficulties assessing student engagement, CAS is often not prioritized by students relative to other parts of the IBDP curriculum.
CAS: communication/leadership/risk-taking
- CAS provides an opportunity for students to develop important non-academic skills through participation in their activities including communication, leadership, and risk taking.
CAS: community interaction
- CAS gives students an opportunity to interact with and learn about people from outside their socio-economic group.
EE: essay writing skills
- The Extended Essay provides important skills in the essay writing process from devising research questions to referencing.
TOK: classroom use
- Teachers and students offered conflicting accounts of the extent to which TOK issues are relevant or useful for other IBDP subjects.
TOK: higher-order thinking
- The TOK course is important in developing non-content based skills such as analytical, critical, and self-reflective thinking skills.
China context
China: research restrictions
- Restrictions such as the internet firewall limit access to relevant resources which is a barrier to inquiry based research. This is problematic for the Extended Essay in particular.
China: use case studies
- Teachers utilize case studies and examples from within China to help explain relevant issues.
China: networks barriers
- There are political and bureaucratic difficulties in building networks with businesses and other organizations. This is problematic for CAS and also IBCC.
China: teaching restrictions
- Political sensitivities can restrict the content teachers cover in certain subjects including 20 th Century World History and Global Politics.
China: minimal implementation impact
- The context of China has only a minimal impact in the implementation of the IBDP. The IBDP therefore succeeds in being a truly international program.
Curriculum: rigorous
- The IBDP curriculum is highly demanding both in terms of academic rigor and workload.
Curriculum: weaker students struggle
- Academically weaker students often struggle with the rigor and workload of the IBDP.
Curriculum: holistic education
- The IBDP provides a broad and holistic education. This contrasts with the potentially deeper content covered by the AP program and A-Levels.
Curriculum: perception of difficulty
- Students perceive the IBDP to be more academically rigorous and to have a higher workload relative to other curriculums including the AP program and A-Levels.
University recognition
University recognition: internationally validated

- The IBDP is increasingly perceived to be recognized and validated for university entrance across the world.

University recognition: unrecognized in US

- There is a perception that the IBDP is under-recognized relative to the AP program by US universities.

Learner profile

Learner profile: not prioritized

- Often not prioritized by students or teachers due to difficulty assessing whether or not the traits are developed through the program.

Learner profile: time to integrate

- Implementation of the Learner Profile philosophy into a school can take time and a lot of effort to achieve. This is more difficult in schools without PYP and MYP.

Learner profile: implicit not explicit

- The Learner Profile is understood to be embedded in the curriculum rather than an overt aspect of the program.

Learner profile: teacher reliant

- It is often the decision of the school or teacher whether or not to actively focus on promoting the Learner Profile traits.

Pedagogy

Pedagogy: analysis/communication/creativity

- IBDP teachers aim to promote analytical, communication, and creativity skills rather than rote learning facts.

Pedagogy: pragmatic drift

- Teachers are increasingly focused on covering the prescribed content and preparing for exams as opposed to more creative forms of teaching.

Pedagogy: promote student engagement

- Teachers focus on classroom discussions and student engagement in their daily teaching as opposed to a lecture-based style.

Private tutoring

Private tutoring: high grade pressure

- Asian students often use private tutors due to pressure – especially from their parents – to get high grades in assessments in a result-oriented culture.

Private tutoring: extra-curricular trade-off

- Schools discourage private tuition due to the opportunity cost of taking time away from extra-curricular activities which may benefit students in other ways.

Private tutoring: teacher support sufficient

- Schools discourage private tuition as the support offered by teachers is argued to be sufficient for students to succeed.

Private tutoring: ineffective for IBDP

- Private tuition is not effective for most IBDP subjects due to assessment testing analytical skills rather than rote learning. However, private tutoring can be effective for Math and Language subjects.

University destinations

University destinations: U.S. emphasis

- IBDP students in China generally prefer Western universities, especially those in the U.S.

University destinations: ranking emphasis

- IBDP students in China generally have a strong emphasis on top ranking universities.

University transition

University transition: lack life skills

- Relatively sheltered school experiences alongside a strong work ethic can result in students lacking social and life skills prior to their transition to university.

University transition: students very confident

- Students are generally very confident about their ability to handle the academic standard and work level at university.

University transition: study skills

- Students are well prepared for their transition to university in terms of study skills such as critical thinking, communication, and time management.

University transition: prepared for content

- Students are well prepared for their transition to university in terms subject content. Final year IBDP subject matter is the same level as first year university studies.

University entrance: taken for granted

- The vast majority of IBDP students expect to attend university. This is also true for IB Certificate graduates.

Others

Core components: support university applications

- The core components of CAS, EE, and TOK are beneficial to students for interviews and personal statements as part of the university application process.

IBO: challenges maintaining standards

- The IBO faces challenges maintaining the IB philosophy and high standards as the number of IB schools increase across the world.

IBDP grading: university application distinction.

- The grading structure of the IBDP enables students to distinguish themselves from other curriculums in university applications. For example, a IBDP Grade 45 is identified as more difficult to achieve than 4 A*'s at A-Level.

IBDP students: stress

- The high work load alongside pressure to achieve high marks in assessments can result in students becoming stressed and anxious.

International and national school: no differences

- There are no major differences in the implementation of the IBDP between international IBDP schools and national IBDP schools in China.

International school: inter-cultural understanding

- The wide range of nationalities of both students and staff in IBDP schools in China promotes inter-cultural understanding.

Student support: ample support

- Students are offered ample pastoral support from teachers and counselors to ensure they are on top of the work load and to help with any academic and non-academic problems.

University choice: ample support

- Students are given ample support in deciding which university and course to apply for through for example meetings with school counselors and lectures from university representatives.

3.3. KEY THEMES ACROSS CASE SCHOOLS

In this section, we will identify the most salient themes from the interview data across the five case study schools. The themes include 1) Learner traits of IBDP students in China, 2) Core Components, 3) China context, 4) Curriculum, 5) University recognition, 6) Learner Profile, 7) Pedagogy, 8) Private tutoring, and 9) University destinations. Each of the themes emerged in three or more of the case study sites.

3.3.1. LEARNER TRAITS OF IBDP STUDENTS IN CHINA

The majority of IBDP students from the five participating IBDP schools in China were of Asian descent but with non-Chinese citizenship. Whilst being careful not to stereotype, the teachers and administrators noted that certain learner traits were specific to these Asian students' socio-cultural norms and values. There was consensus among four of the schools that one of these traits included a strong work ethic which may positively affect students' success in the IBDP. In particular, one teacher stated that "...we have some very, very dedicated studious students who will spend six, seven, nine hours a night doing homework and that's what it takes to do well in the IB." (School 1, Teacher 1)

The participants established that, coupled with their strong work ethic, Asian IBDP students in China also had extremely high expectations for their IB studies. Accordingly, it was thought that an emphasis on high grades resulted in a narrow focus on preparation for assessments. A headteacher poignantly contended that students, therefore, often reduced the IBDP to a "high-stakes" exam:

...it is my impression that in Asia with the traditional approach with the Gaokao, in Korea there is a similar process and in Japan, it is very linear. It is all about taking the next step and entering the right university so passing the exam is the priority. So my impression is that unsurprisingly in a culture that associates success at university with success in high stakes exams for high school students, that is often where the focus is. (School 2, Headteacher)

In four schools teachers and administrators highlighted that another characteristic of Asian IBDP students in China was that they initially struggled with critical thinking and

[The participants established that, coupled with their strong work ethic, Asian IBDP students in China also had extremely high expectations for their IB studies.]

communication skills. As a coordinator recounted in an anecdote, these traits were often counterintuitive to these students' cultural heritage:

Being critical is a bit more a Western tradition. It takes the Asian kids a while to realize that they can disagree with the teacher and I won't get angry. Sometimes at parents' evening I say that the son or daughter does not speak enough in class, and they say 'thank you very much'. I say 'I want them to speak more' and they say 'oh no, no, no my child should not speak in class'. But I really want them to engage, especially in the small classes.
(School 4, IBDP Coordinator)

[The Core Components of Creativity, Action, Service (CAS), Theory of Knowledge (TOK) and Extended Essay (EE) were accepted by administrators, teachers, and students to be positive to the program.]

3.3.2. CORE COMPONENTS

The Core Components of Creativity, Action, Service (CAS), Theory of Knowledge (TOK) and Extended Essay (EE) were accepted by administrators, teachers, and students to be positive to the program.

CAS: Teachers and administrators from all five schools concurred that one of the core aims of CAS was the development of non-academic Learner Profile traits. In particular, they considered that the compulsory nature of CAS ensured that students were given ample opportunities to develop skills such as leadership. As one teacher argued:

I think the CAS is great, especially the service element. And I think that with the IB requirement, we really have to get the kids to do this, whereas if it was out of choice, some of them would, some of them wouldn't. And I think if we're trying to educate and nurture the whole person, I think CAS does a lot for that, in terms of nurturing social skills, going to the wider world – it builds their confidence, builds their leadership. (School 4, Teacher 1)

However, they also noted that students often did not prioritize CAS due to the binary nature of the assessment criteria, as simply pass or fail. This view was apparent in one student's remark that the assessments were not always authentic reflections of CAS activity, "Because you know that they are either going to pass or fail you; you are not going to get a grade and obviously the school is going to

want to pass you, so the reflections/pieces of evidence may not actually be reflective." (School 4, Student 1)

Related to this, in some schools, there were accounts that students did not necessarily have to embrace the philosophical goals of CAS in order to complete the course. As a headteacher pointed out, while the assessment of CAS has improved from recording the number of hours to writing reflections, this did not ensure that all students engaged with the ethos underlying CAS:

I know the IB has gradually tried to move things more towards the qualitative aspects in contrast to just the number of hours, which is great. Still it takes a concerted and common effort to really buy into the philosophical goals of the CAS program. (School 2, Headteacher)

Furthermore, there were limited ramifications for students not engaging in CAS in an authentic manner. For instance, some such students were still admitted into elite universities, particularly in the U.K., as one teacher described in this anecdote:

Just today one of our students was threatened to have the Diploma removed from him at this very late stage because his CAS portfolio was in an absolute mess. Now this student, and this brings up the whole idea of what's important to universities, was rejected by Harvard and Stanford and many, many very good schools in America but got an offer from Oxford. And it really seems to be the case that the American universities value this, and the British simply don't. (School 1, Teacher 1)

EE: Interviewees from all five schools were in strong agreement that students found the Extended Essay to be a highly important first experience of researching and writing an academic essay. In particular, they emphasized that in the process, students were given opportunities to learn through mistakes under the guidance of teachers. As one coordinator described:

What I love about it, is that under the wing of the advisor while the kids are still living at home, and in a high school and people still know their names and follow up on them and chase them up when they miss a deadline, they get to make all of these

[In some schools, there were accounts that students did not necessarily have to embrace the philosophical goals of CAS in order to complete the course.]

mistakes with their first research task. They get to not write their bibliography properly even though you've taken them through citations three thousand times, they get to misnumber their pages and all that kind of stuff and have people here who actually follow up with them on that kind of thing and point them to the details of academic writing. (School 2, IBDP Coordinator)

[Teacher and administrator groups from each of the five schools argued that TOK was a distinguishing feature of the IBDP.]

TOK: Teacher and administrator groups from each of the five schools argued that TOK was a distinguishing feature of the IBDP. It was considered that the course was crucial in taking students out of their comfort zone and encouraging them to engage with philosophical issues and debates. As one coordinator explained, this was important in developing skills, such as critical thinking:

TOK is really useful because it teaches kids to think...students are taught to question everything they know. The example I give to the kids is one plus one equals two, the most basic thing you know is not true: if you have one part of sugar and add another part of sugar then you still have one pile of sugar. (School 4, IBDP Coordinator)

Furthermore, in three of the schools, teachers contended that the epistemological issues covered over the TOK course were valuable in enabling students to identify relationships between subjects. As the headteacher of one school stated, this contrasted to their experiences of other curriculums:

I think interconnectedness of content is something that students really did not grasp when I was in high school in the U.K. It was very much a silo mentality. Even in Math and Physics I cannot remember teachers saying 'you know how you are doing this in Physics, this is how it connects to Math'. TOK provides ample opportunities for those type of connections. (School 2, Headteacher)

3.3.3. CHINA CONTEXT

Although the China context is a unique one, teachers across all five schools pointed out that this had minimal impact in the implementation of the IBDP program. One headteacher described that this limited influence of context was indicative of the versatility of the IB to remain consistent despite its geographical location:

The whole point of why I like the IB is the international aspects of it. It is usable, it is not watered down results wise, you know where you are with it, and you can apply it to so many different countries. (School 4, Headteacher)

[Interviewees across all five schools agreed that there were some restrictions in teaching certain subjects due to political sensitivities.]

Despite their notion of the adaptability of the IB program across different cultural contexts, there were mixed responses regarding how the China context influenced the teaching and learning of the IBDP. Interviewees from three of the five schools highlighted the benefits of teaching the program in China and found country-specific case studies to be useful examples in teaching. Interestingly, one teacher noted that Chinese-specific case studies contributed to the global orientation of the program:

The teaching is very different because one of the aims of the IB is to be international. All of our students are international. I teach Geography and I use lots of examples from China which may sound very un-international because we are in China. But in actual fact the students' knowledge of China is not actually that good. So I find examples from Three Gorges Dam or migration in China actually makes it international. (School 4, IBDP Coordinator)

On the other hand, interviewees across all five schools agreed that there were some restrictions in teaching certain subjects due to political sensitivities, particularly in the teaching of the *20th Century World History* course. As a teacher described:

Because of my subject and this is a single party state, you have to be careful what you say. They didn't dictate but a suggestion was made about what I could and could not talk about. I was surprised by what I could teach as I assumed I couldn't teach certain issues. (School 3, Teacher 1)

3.3.4. CURRICULUM

There was strong agreement by interviewees from all five schools that the broad nature of the Subjects Requirements was one of the strengths of the program. One coordinator highlighted that this breadth prepared students to meet the challenges of everyday modern society:

You need to leave high school with a certain mathematical skill level. So when students say, ‘I don’t want to do the IBDP because I don’t want to do Math’ (our Arts students), we say that, ‘no, in order to get on in the world today, in order not to be taken advantage of, yes that’s a requirement’. That’s why we appreciate the IB. (School 1, IBDP Coordinator)

[Interviewees from all the schools thought that the IBDP was highly regarded by universities worldwide.]

Students from all five schools perceived that the highly rigorous and broad nature of the program meant that the IBDP was more challenging compared to the AP program and A-Levels. Indeed, they perceived that students taking other curriculums had a significantly lower workload. As one student argued:

I think it is academically challenging as it covers a really wide range of subjects and courses like the EE and CAS. I talked to some of my friends in the U.S. Some of them are doing the AP and what I hear from them is that they get off from school at around 1 p.m. and do not have much work to do afterwards. But when you do the IBDP you do not only have to take all of the exams and the courses but also complete all of the internal assessments and extra coursework. I find it quite challenging. (School 4, Student 2)

3.3.5. UNIVERSITY RECOGNITION

Interviewees from all the schools thought that the IBDP was highly regarded by universities worldwide. This view was outlined by a headteacher in the following excerpt:

Being an international school, you try to find models of education that will allow your students to have maximum opportunities to pursue tertiary education and the IBDP is a program that is widely received. We have students who go to the Commonwealth countries and the American universities. So for our student clientele, the IB fits well in providing them with a highly rigorous, externally-validated educational program. (School 5, Headteacher)

More specifically, the recent recognition of the IBDP by certain South Korean universities was considered by interviewees to be indicative of the growing international reputation of the IB. As one of the teachers explained, the IBDP has consequently grown in popularity as an alternative route for university entry compared to the national educational system:

A couple of years ago Korean universities got on board with the IB and are allowing IBDP students into Korean universities. Their admissions are very difficult, it is crazy hard to get into a Korean university. So when they opened up the route of being able to get into Korean universities with an IB Diploma it became a popular choice for Korean students, as they could not otherwise gain entry as they had been out of the Korean school system and did not have the skills to do well on the entrance exams. (School 5, IBDP Coordinator)

In contrast, students from three schools perceived the IBDP as less widely recognized by U.S. universities compared to the AP program and the SAT. This perception was thought to result from the fact that universities in the U.S. generally do not give credit for Standard Level (SL) courses in the IBDP, as a headteacher explained:

But there is a perception that American universities like the AP more than the IB. And where that comes from is that American universities won't take SL IB courses, but they take all AP courses so it gives an internal validity to AP versus the IB. (School 5, Headteacher)

3.3.6. LEARNER PROFILE

The IB Learner Profile was generally accepted to be a positive aspect of the curriculum. Yet, teachers and administrators from four schools agreed that the IB Learner profile was not sufficiently explicit in the curriculum. As one coordinator argued:

It is there, it is embedded in the way we teach our classes. I would like to see it more overt, more obvious than it is. It is up to each school to implement the Learner Profile as it fits. I would love it to see it as even more prominent from IB, embedded even more obviously in the curriculum. (School 5, IBDP Coordinator)

Related to this, teachers and administrators from all of the five schools noted reliance upon the school or teacher in the promotion of the Learner Profile. This view was summed up by a teacher:

[Teachers and administrators from all of the five schools noted reliance upon the school or teacher in the promotion of the Learner Profile.]

I think it's really up to the individual teacher to implement. It's not necessarily built in, in the way it's taught. There is really very little guidance on how the IB is taught, which is possibly a shortcoming...it is the assumption that if you are a reputable school, you will find teachers to be able to teach the program. (School 2, Teacher 1)

As the Learner Profile is a non-assessed component of the IBDP, students and teachers across all five schools contended that students may not always give it priority in IBDP studies. One headteacher commented on these cases:

...we must not lose sight of what the Learner Profile is and the ethos. So I guess the demands of the modern world make it quite difficult sometimes when people are trained up to pass exams and try to get to university – it is a difficult balance between the two. (School 4, Headteacher)

3.3.7. PEDAGOGY

Interviewees from all five schools agreed that teaching the IBDP required unique pedagogical approaches that aimed towards analytical, communicative, and creativity skills. As one coordinator emphasized, promoting communication skills is one of the *foci* of teaching the IBDP effectively, “Very clearly is the communication skills because they do a lot of writing and presenting to improve their communication skills.” (School 3, IBDP Coordinator)

Another coordinator recounted the importance of teaching analytical skills, as opposed to rote-learning, to enable success in IBDP assessments:

The big difference I think is that the IB teaches kids to think, it does not teach them to memorize facts. For example, last year when kids were entering the exam room I checked their pencil cases to make sure they are not cheating. One kid said to me ‘I don’t know why you bother because you can’t cheat in IB exams’ and I said ‘what do you mean?’ they replied ‘well it doesn’t matter how much you know or notes you have on bits of paper, it is how you use it in the exam that matters.’ I thought great, because it is all about

[Interviewees from all five schools agree that teaching the IBDP required unique pedagogical approaches that aimed towards analytical, communicative, and creativity skills.]

thinking, not just about content of knowledge. (School 4, IBDP Coordinator)

In practice, it was observed that pedagogical methodologies in teaching the IBDP hinged on facilitating student engagement and classroom discussion. For example, one headteacher described the objectives of their school's teaching practices as, "student choice and empowerment" and "defense of argumentation":

In short, I would say in the classes I've observed this year, one thing is that there is a fair amount of student choice and empowerment. So I think that core to being a learner is to have some choice and involvement in curricular decisions and to demonstrate that. I think our teachers try to promote thinking and not just giving students information in the IB Program. They ask a lot of questions that are thought-provoking and that require independent research, independent thinking, defense of argumentation. (School 5, Headteacher)

3.3.8. PRIVATE TUTORING

There are many reasons why IBDP students in China are engaged in private tutoring. Teachers and administrators from all five schools agreed that IBDP students in China—particularly students with Asian heritage—mainly chose to have private tutoring due to intense competition inherent in a results-oriented culture. As a teacher described: "The competition they receive and their parents perceive, getting them into the right universities, drives them to go to tuition after school." (School 4, Teacher 1)

The majority of interviewees, particularly the headteachers and teachers, put forward the argument that private tutoring was not relevant to the IBDP. Teachers and administrators from three schools argued that the support from teachers was sufficient and that consequently private tutors were unnecessary. As a coordinator said, "Actually, I always tell my students, you must make full use of your teachers; there is no need for a tutor." (School 3, IBDP Coordinator)

Teachers generally regarded private tutors as inexperienced with IBDP pedagogy and also reported that the analytical

[*The majority of interviewees, particularly the headteachers and teachers, put forward the argument that private tutoring was not relevant to the IBDP.*]

nature of IBDP assessments rendered private tutoring as ineffective, except for base skills required in Math and Languages. As a teacher stressed:

At first I think private tutoring does not work for the IB program because the content, knowledge-base is far beyond any tutors' knowledge. They can't do it. My students say that when they have tutors they don't even know how to tutor the kids how to cope with the IBDP program. (School 5, Teacher 1)

In addition, teachers from three schools strongly discouraged private tutoring as such practices competed with time that could be better utilized engaging in extra-curricular activities. As one teacher argued, "And again that's time they could have spent bettering themselves, doing some service or relaxing". (School 4, Teacher 2)

3.3.9. UNIVERSITY DESTINATIONS

University destinations of IBDP students from China formed a notable pattern in terms of ranking and geographical location. According to university ranking, teachers and administrators from three schools remarked that students often focus on top ranking universities as destinations regardless of potential suitability. As one of the headteachers expressed, "...there is an emphasis on what is sometimes called the 'trophy admissions', the Ivy Leagues, the best known schools, those are the ones that families aspire to." (School 2, Headteacher)

Interviewees from four schools reported that the U.S. was the most preferred destination geographically for IBDP students. This was outlined by one teacher who stated:

Everyone wants go to America. You have the odd kid who doesn't have any American connection and wants to go to Australia or Hong Kong. But by and large, we are a very US-centric school. (School 3, Teacher 1)

Another factor influencing student university destination was nationality. The participants noticed this partially resulted from a cultural preference for studying in their home country due to an existing social support network. However, interviewees from all five schools also noted that nationality influenced choice of university destination due to financial incentives. As the headteacher of one school explained:

[Interviewees from four schools reported that the U.S. was the most preferred destination geographically for IBDP students.]

And nationality matters because of tuition fee issues. If you are a Canadian passport holder, there are tuition benefits to going to a Canadian university, as there are definitely benefits to going to an Australian university if you are Australian. (School 5, Headteacher)

3.4. RELATIONSHIPS BETWEEN THEMES

To shed light on how the IBDP prepares students for their transition to university, we will provide in this section an in-depth account of the most commonly identified relationships between themes quoted by the interviewees. To this end, we created a thematic network based on the relationships between pattern codings, illustrated in Figure 15 (see also Appendix 5). Specifically, our discussion focuses on links between 1) IBDP curriculum and IBDP university recognition; 2) IBDP academic content and student preparation for university subject matter; 3) IBDP curriculum and student preparation for university study skills; 4) Teacher pedagogical practices and student preparation for university studies; 5) Factors affecting student confidence about entering university; and 6) Pedagogical autonomy and authentic engagement with the Learner Profile and CAS. The reason for this focus is that those relationships were identified at least in three schools; numbers above arrows in the Figure 15 indicate how many schools commonly reported such relationships based on the interview data. In other words, to ensure focus on the key relationships, we exclude case-specific relationships that were identified in less than three schools.

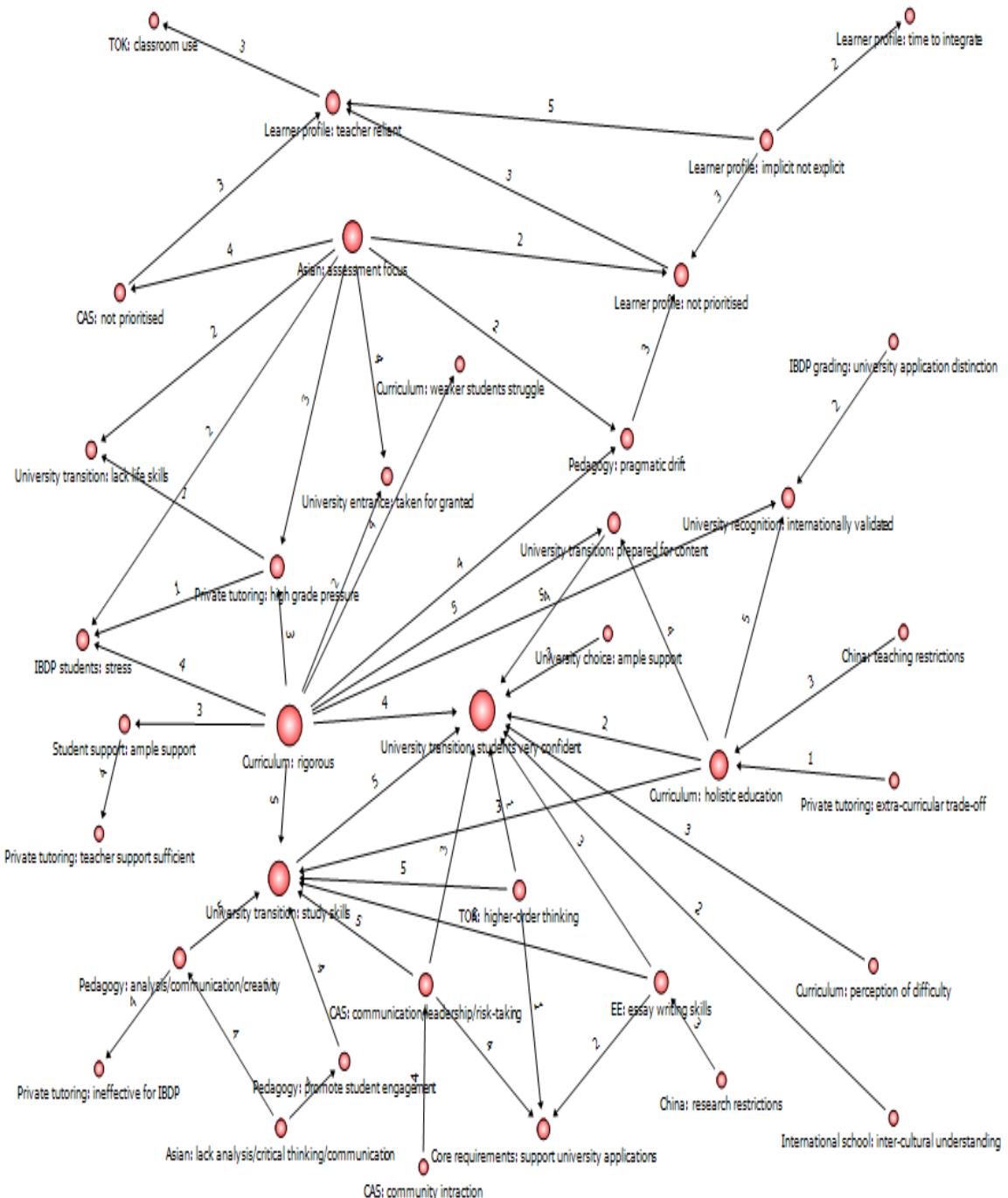


Figure 14. A Thematic Network

3.4.1. IBDP CURRICULUM AND UNIVERSITY RECOGNITION

Teachers and administrators were confident that the IBDP was internationally recognized for providing first-rate university preparation. They perceived that this was especially the case with Europe-based universities, but was increasingly true for Asian and U.S. universities. There was consensus across all five schools that this in part resulted from the rigor of the curriculum in terms of both academic depth and workload. Moreover, it was stated that the reputation of rigor could offer IBDP students an advantage in university applications relative to other curriculums. This view was apparent in one student's report of receiving positive feedback from universities, "From my research, every single college mentioned the IBDP as the most rigorous course so there is no debate over that. They definitely think that it is a really good course and a good preparation for students to go on to good colleges." (School 5, Student 1)

[*Teachers and administrators were confident that the IBDP was internationally recognized for providing first-rate university preparation.*]

Teachers reported that universities recognized the stringency of the IBDP assessment grading structure. For instance, some teachers argued that the top IBDP grades were held in higher esteem by many universities relative to highest grades in other curriculums. As one teacher explained, this enabled elite universities to identify top performing students in the admission process:

They have no way of deciding who's the better candidate so Oxford and Cambridge have talked about imposing their own exams because they're finding it so difficult to differentiate between candidates and they have pointed out that kids who are getting 6s, 7s on the IBDP are both A* level on the A-level. So they can really tell who the cream of the crop is by who is getting the 7s. (School 4, Teacher 3)

A minority of participants reported that the breadth of the IBDP curriculum came at the expense of covering content in-depth, relative to A-Levels and the AP program. Nevertheless, there was agreement in five schools that, overall, universities valued the IBDP's structured holistic education achieved through the Core Components alongside more traditional subjects. This view was summed up by a headteacher, who explained:

In an ideal world with a strong school, the advantage the students have is the breadth. I would want someone coming to me at university with research skills, TOK thinking, CAS. Many good schools will do Creativity, Action, Service, but to actually have that as

part of your curriculum with reflections that definitely would be an advantage. Of course, some of the best students in other curriculums may do this of their own back but it is not part of their course structure. (School 4, Headteacher)

[CAS was highlighted in four schools as providing desirable skills such as leadership and communication that were held in high regard by universities.]

More specifically, CAS was highlighted in four schools as providing desirable skills such as leadership and communication that were held in high regard by universities. Furthermore, as one of the teachers pointed out, strong achievements in CAS could potentially compensate for not fulfilling relevant grading criteria in the university admissions process:

I know of one case where one of my CAS students got a full scholarship because of her CAS work, not because of her marks. We were raising funds for this IB tsunami relief fund in Indonesia (that was where I was). And she had done some brilliant work and recorded it beautifully. She didn't have the marks for admissions but when she went for the interview, they looked at her CAS and said they wanted to give her a scholarship. (School 1, Teacher 1)

The teachers and administrators generally thought that the IBDP's holistic approach to education was more suited to U.S. universities relative to those in Europe or Asia. This was due to greater emphasis on extra-curricular activities and the covering of a wider range of subjects through elective courses in U.S. universities. In spite of this, some respondents held the view that the IBDP remains under recognized in the U.S., relative to the AP and SAT.

3.4.2. IBDP PREPARATION FOR UNIVERSITY ACADEMIC CONTENT

Interviewees across all five schools thought that the academic content covered over the IBDP prepared students well for their transition to university. Based on anecdotal feedback from IBDP graduates, many of the teachers argued that the subject matter covered, especially in Higher Level (HL) courses, was at least equivalent to that of first year university studies. Consequently, one of teachers stated, "A lot of our students are coasting through first-year university after the IB Program because they worked so hard in Year 12 and Year 13, which is great." (School 4, Teacher 2)

The teachers also explained that the type of content studied through the IBDP was often tailored to suit university courses. This position was expressed by an Economics teacher who argued, "I think

certainly the level of content that they need to have, the depth of knowledge is extremely useful when they go to university. Just taking Economics; they have introduced Math paper specifically for students who want to study Economics in university." (School 4, Teacher 3)

Furthermore, interviewees from four schools shared the view that the breadth of the Subject Requirements was generally beneficial for university studies. Teachers and administrators noted that students benefitted from taking courses from six subject groups and therefore did not need to specialize too early. As one of the teachers expressed:

It's great that kids can get a taste of different subjects and get to know their talents and strengths. It's a great time for them to try Psychology or Economics before they get to university when they start picking a degree or a major in a field that has some economic cost to it, time costs. (School 1, IBDP Coordinator)

However, some teachers and administrators argued that the academic rigor, combined with the breadth of content, could be too much for some students. As a result, interviewees from four schools expressed the view akin to that, "It's rigorous and it's stressful, and many of our students can't cope with that stress so they need a lot of support." (School 5, Teacher 2)

It was understood that an excessive workload could have serious implications for students as it left minimal time for Learner Profile traits to be gained through extra-curricular activities. As one of the coordinators contended, "It's too big, there is too much work. I mean one of the Learner Profile characteristics is 'balanced'. Our kids are not balanced. I think back to when I was a kid, I was working in the evening three days a week, I was playing sport every weekend, I was going out. But these kids just do not get time." (School 4, IBDP Coordinator)

3.4.3. IBDP PREPARATION FOR UNIVERSITY STUDY SKILLS

There was strong agreement among the five schools that, over the course of the IBDP, students developed core study skills that would stand them in good stead for university studies. Indeed, the majority of participants saw such skills as more important for university transition compared to merely covering similar academic subject content.

[Some teachers and administrators argued that the academic rigor, combined with the breadth of content, could be too much for some students.]

In particular, it was suggested that students became highly proficient at communication, critical thinking, and time management, which could set IBDP students apart from graduates of other curriculums. For instance, in discussing the relative merits of the IBDP and the AP program for applying to universities one of the coordinators argued, “It is presented in a way that ‘well, of course they will get you into university so then what do you want from your learning’. I argue that both will get you to university, but I think the IBDP will prepare you for success at university rather than just getting you in.” (School 5, IBDP Coordinator)

The teachers and administrators were unanimous in their belief that the three Core Components were important in promoting a seamless transition to university. Firstly, across the five schools, participants agreed that CAS was beneficial in counter-balancing an emphasis on academic studies and could facilitate the development of non-academic Learner Profile traits. They emphasized that by giving students the responsibility to organize their own projects, participants often made significant progress in gaining communication, leadership, and time management skills. As one of the teachers contended, this could provide a confidence boost for their transition to university:

They're being encouraged to take a project and run with it, so not just to join a sports team but coach some younger students, and they're founding clubs all over the place. They will probably get to university and think, 'oh there isn't a wind ensemble, let's start a wind ensemble'. I'm not sure if I would have had the confidence just to walk in and go, 'oh, I'll put up a notice saying who wants to be in a wind ensemble' in my first year of university. I think it does a lot for that. (School 4, Teacher 2)

Secondly, the Extended Essay was emphasized by participants from all five schools as providing important training in university essay writing ranging from devising research questions to writing a bibliography. The following quote from a headteacher was indicative of this view:

I think the EE is extraordinarily valuable. I think you're going to write some significant papers in university that you don't get to write in a secondary school environment. So having the experience of researching

[The Extended Essay was emphasized by participants from all five schools as providing important training in university essay writing ranging from devising research questions to writing a bibliography.]

the topic yourself, developing your research questions, citing sources, that's very valuable to getting an introduction of what it's like to write a research project, because when you get to university the professor is going to ask you to write a paper, you must pick your topic, design your paper, and here we guide kids through that process. (School 5, Headteacher)

Thirdly, although they expressed difficulties in accurately characterizing the benefits of TOK, interviewees from all five schools argued that the course provided an important grounding in epistemological issues. As one of the teachers described, this was considered to be vital for helping students develop a cognitive maturity to a level appropriate for engaging with university level academic issues:

...one of the crucial things about transitioning to university is that they have to start to think for themselves, evaluate the different views of people who are telling them things, how reliable their sources are, and all those sorts of things. So I think taking a bit of time to discuss specifically, how do we know, how do we decide who we're going to believe in different situations, is important for university study where they're increasingly given access to a bunch of books and encouraged to make their own judgment. (School 4, Teacher 2)

3.4.4. PEDAGOGY AND UNIVERSITY TRANSITION

Teachers from all of the five IBDP schools described how they tailored their pedagogical objectives and methods to promote learner traits relevant for university studies. This included endeavoring to go beyond a rote-learning approach to help students become analytical, critical and independent thinkers. As one of the teachers explained, this emphasis stood in contrast to their experience of other curriculums and it could give IBDP students a competitive edge at university:

Korean high school programs are nothing like the IB program at all. The IB program is really designed to help students adapt to university situations, so they can analyze things and do research. We train them. But in the Korean system, no, we just prepare for the university entrance exam. So after they get into

[*Teachers from all of the five IBDP schools described how they tailored their pedagogical objectives and methods to promote learner traits relevant for university studies.*]

university they just don't know what to do. So in university you have to teach them again about the whole process, how to do those kind of studies. (School 1, Teacher 2)

To achieve this, teachers from four of the schools explained that they sought to employ 'student-centered teaching' methods. This involved actively engaging students through classroom discussions, group work, and presentations. As one of the coordinators noted:

We ask teachers to do 'student centered effective teaching' which means that we must get the students involved activities to promote their higher order thinking skills. This teaching methodology will cause their learning style to change and then I think by pushing them or initially inspiring them to think deeply this pedagogy already prepares students for university. (School 3, IBDP Coordinator)

As explained in the previous section, the participants acknowledged that Asian students often initially struggled to engage fully in critical thinking and classroom discussions. In response to this, teachers at four schools adapted their teaching methods for Asian students to promote both academic and oral engagement. As one of the teachers noted, this was accepted as a vital part of preparing for study at U.S. universities:

For myself, from day one I just throw them into the fire. First day, you get up and introduce yourself in front of the whole class. My reputation here is baptism by fire, get up and start talking. Your parents are paying a lot of money to get you here and let's just get it together. You want to come to my country and go to school. They are not going to care about your TOEFL score or where you are from but they will want you to get up there and explain it. (School 3, Headteacher)

In spite of this, many of the teachers argued that the pragmatic realities of day-to-day teaching severely restricted creative pedagogical methods. This stood in direct contrast to teachers' ideals of providing IBDP students with study skills relevant for university. The most commonly mentioned barrier, cited in four schools, was the sheer volume of content that teachers needed to cover over the two-year curriculum,

[Many of the teachers argued that the pragmatic realities of day-to-day teaching severely restricted creative pedagogical methods.]

especially for Higher Level (HL) subjects. This frustration was vented by one of the teachers, who argued:

I can't tell you enough, how many conferences I've been to, time and time again, where we're talking about the new innovations in 21st century learning and getting students involved in the classroom, with more critical thinking and freedom of choice. It always seems to be the IB teachers who raise their hand and says, 'I have a syllabus to get through'. (School 1, Teacher 3)

[*Students from all five schools reported feeling self-assured that the study skills developed through the IBDP equipped them well for university studies.*]

3.4.5. STUDENTS CONFIDENT ABOUT UNIVERSITY TRANSITION

A key finding from the student interviews was that the IBDP graduates were extremely confident about entering university. The vast majority described that, after completing the IBDP, the transition to university felt like a natural progression. As one student asked rhetorically, "If you have taken such challenging courses, why would you not take the next step?" (School 5, Student 2)

Following this, students from all five schools reported feeling self-assured that the study skills developed through the IBDP equipped them well for university studies. The most common study skill mentioned by students was time-management. As identified in the following quotation, the students remarked that after experiencing the heavy workload of the IBDP they were confident about being able to organize their time effectively at university:

I talked to last year's seniors, who graduated from the IBDP. They told me the one thing that is most important at college is time management. You have so much time and there are so many events going on but you also need to find time to study. So time management is very important and I think the IBDP really did prepare us well for time management. I would say that I am confident about going to college without worrying too much. (School 5, Student 1)

The students were also highly confident about completing university level assessments ranging from presentations to essay writing. This was largely due to the undertaking of similar tasks during the IBDP. Additionally, as is implied in the following statement, IBDP graduates often regarded themselves as being better prepared for university assessments relative to graduates of other curriculums, "We have contacted graduates from our school already at university and they say that

when the professor gives you a task such as a 2,000 word essay that needs to be handed in, in two or three days, many students panic, but IBDP students say ‘we can handle this.’” (School 3, Student 1)

In four of the schools, students believed that the subject matter covered during the IBDP would enable a relatively seamless transition to first year university studies. Again, as one of the students explained, they felt that this put them in an advantageous position in comparison with non-IBDP graduates:

I am going to art school. I did Higher Level Visual Arts and I feel that this has really prepared me for university. There is a lot of work, but I pulled together all of my ideas and I am used to the workload. I know one of my friends where their school in the U.S. does not require any art, and she went to art school, which was really hard for her at first because she wasn’t expecting all of the new courses. (School 4, Student 2)

3.4.6. IMPLEMENTATION OF THE LEARNER PROFILE AND CAS

There was concern among participants that the philosophical ideals of the IB were often not prioritized in the day-to-day implementation of the IBDP. In particular, teachers and administrators argued that a symptom of the implicitness and lack of assessment of the Learner Profile was that there was no guarantee that the learning outcomes would be adequately promoted by schools. Indeed, in all five schools it was argued that the degree to which the Learner Profile was brought into lessons was reliant on the ability, commitment, and persuasion of the teacher. This view was succinctly outlined by a headteacher of one the schools:

The adherence to the ethos and the philosophical goals of the program I have always found to be challenging and it really does depend on the extent to which teachers and administrators are willing to prioritize that as something to spend professional development time on. (School 2, Headteacher)

Moreover, participants argued that, in the context of a result-oriented culture, the Learner Profile often took a backseat relative to the assessed parts of the IBDP. As one headteacher

[There was concern among participants that the philosophical ideals of the IB were often not prioritized in the day-to-day implementation of the IBDP.]

outlined in the following quotation, it was thought therefore that the IBO needed to respond by making the Learner Profile more explicit in the curriculum:

I was on the focus group about the IBDP for the Asia Pacific region. What I said was that unless it is something that it is assessed and evaluated, it is something that easily falls to the background in an Asian community. I know that is sweeping generalization, but that is what I have heard to be true. But I think if the IB still thinks that it is a fundamental part of the Diploma that is worth promoting as much as academic content then it really has to be woven more effectively into the curriculum even if that is at the cost of taking out some of the content. Unless teachers and students are really directed in a prescribed way to make reference to and make the connections around the Learner Profile it quickly falls into the background. (School 2, Headteacher)

[Teachers and administrators in four of the schools described that it was difficult to ensure that students engaged with CAS in a truly authentic manner.]

Similarly, teachers and administrators in four of the schools described that it was difficult to ensure that students engaged with CAS in a truly authentic manner. It was consistently noted that a socio-cultural emphasis of IBDP students in China on academic work often came at the expense of commitment to CAS, which could be seen as a ‘box-ticking’ exercise. As one of the coordinators described, this stood in stark contrast to their experience of working in a Bangladeshi community where a high proportion of students came from the families of Non-Government Organization’s (NGO) or similar service professionals:

The students in Bangladesh were mainly expats and their parents were mainly from development backgrounds. So their family values were all about service and that is who their parents were and that is what the kids were like. They were born intrinsically in love with the core pieces of the Diploma; CAS, integrity and the pieces of the Learner Profile were absolutely already there. So much of my coordination there was to get them to the academic level to handle a rigorous program. The students in this culture, this school has a pretty high academic pressure, everybody does their homework, that is the norm. It is cool to work hard at school, that is definitely the culture here. So the academic part is easier here. The students here

are more comfortable with the academic side of things than they are with the opposite, the Creativity, Action, Service part. (School 5, IBDP Coordinator)

On the other hand, some respondents noted that CAS served as an important counter-balance in a results-oriented culture. They argued that CAS was especially important for academically focused students as it provided a structured opportunity to engage in non-academic activities. As the following excerpt signifies, this was understood to be an essential aspect of a holistic education:

The CAS piece is hugely important again especially here and with my school's culture of 'it is all about the grades'. Some students can get locked into that is it, the be all and end all is my GPA and my straight 'A' average. I love that the DP program says well actually let's look at some other parts of your life too; are you giving back or are you looking after your body too, getting some physical exercise, and do you spend time being creative. (School 5, IBDP Coordinator)

3.5. VARIATIONS BETWEEN SCHOOLS

The interviews revealed nuances between the five schools in the implementation of the IBDP. As we will outline in more detail below, this included variation in 1) Approaches to teaching the Learner Profile; 2) The promotion of IB ethos to pre-IBDP students; 3) Attitudes towards private tuition; and 4) The impact of school size on student support provisions.

3.5.1. APPROACHES TO TEACHING THE LEARNER PROFILE

There was considerable variety between schools in the method, and extent to which, the Learner Profile was utilized by teachers. This diversity in approach was largely acknowledged by teachers and administrators as stemming from limited explicit guidelines from the IBO, which resulted in significant teacher autonomy in the promotion of these traits. For example, a coordinator at one school took the initiative to endorse, through various activities, a single Learner Profile characteristic on a monthly basis:

So I said let's take the traits and every month focus on one trait...and they've come up with some really creative ideas, explaining what the trait is, whether the example comes from the subject content or whether it comes from films they've put together to

[There was considerable variety between schools in the method, and extent to which, the Learner Profile was utilized by teachers.]

exemplify it. For example, ‘knowledgeable’, they said we’re going to deconstruct a game show, and put our own game show together, and then present that to the school, they had a lot of fun with that. (School 1, IBDP Coordinator)

This contrasted with approaches by other schools where teachers generally reported that, if good pedagogy is practiced, the Learner Profile traits would be implicitly promoted in the teaching of the IBDP curriculum. As one of the teachers explained, “I don’t have a list and then say ‘right, today we are going to focus on this particular thing’. But in the way I talk to my students and the way they interact with me, hopefully, those skills will be brought across.”(School 4, Teacher 2)

3.5.2. IB PHILOSOPHY IN IBDP-ONLY SCHOOLS

None of the participating schools offered the full IB continuum of the Primary Years Program (PYP), the Middle Years Program (MYP), and the DP. Consequently, students were often only introduced to the IB philosophy at the IBDP level. As identified in the following quotation, this was thought to lead to difficulties in promoting the core goals and values of the IB to these IBDP students:

Coordinating the program here does come with a lot of challenges. When I talk to other coordinators, even in this city; we get together probably a couple of times a year, as coordinators and we just talk about common issues. I don’t feel that the other coordinators face some of the issues that I have to face here. There just seems to be more of an implicit acceptance of the IB program and mission and values and education in the schools, probably because they have the three programs in the schools. They don’t seem to face the same kind of struggles as I feel we do here.
(School 2, IBDP Coordinator)

As a solution, some schools extended the IB ethos to the whole school, allowing for greater integration. For instance, one school integrated the Learner Profile into their school-wide mission statement. As the coordinator of the school explained, promotion of selected Learner Profile attributes were aimed at both pre-IBDP and IBDP students:

I happen to be in a lucky position as we have a mission statement and our mascot, ‘The XXXX’, each of those

[*None of the participating schools offered the full IB continuum of the Primary Years Program (PYP), the Middle Years Program (MYP), and the DP.*]

letters has a meaning, and our school's mission is almost identical to the IB Learner Profile so I am supported by the school. Because the whole school has these same characteristics embedded in everything we do, it is not unique to the IBDP kids. (School 5, IBDP Coordinator)

In another example, it was reported that one of the schools offered a scheme that gave pre-IBDP students an opportunity to participate in CAS-type service activities. As the headteacher explained:

We thought there was some really good stuff going on with our Year 12s and Year 13s, but in what ways are our younger ones getting involved with helping others? In response, they introduced something called the 'School 4 Challenge' of which one aspect is the CAS service element. Even the terminology used is the same as it is for CAS. We are very positive about it as an idea and concept. (School 4, Headteacher)

3.5.3. ATTITUDES TOWARDS PRIVATE TUTORING

There was consensus among at least three of the schools that private tutoring was both ineffective and unnecessary for the IBDP curriculum. In these three schools, private tutors were actively discouraged by teachers and administrators largely due to a belief that rote-learning approaches were incompatible with IBDP assessments and also that students should seek support from teachers.

Yet, respondents in the other schools were more supportive of private tuition, especially for Math and Language courses. Furthermore, in one school, teachers encouraged students to receive private tuition as a remedial tool if they were struggling with the work level. As is shown below, one teacher liaised with private tutors to ensure that they covered the relevant content:

I've recommended tutors for some of my kids because they just missed some skills earlier on and they can't process it and I can't help them enough to get them through practicing, for instance, what a commentary structure is. They need a lot more practice, so it is usually just filling in the blanks for kids who need training for participating in the IB. It has been really successful actually. But I'm in touch with the tutor too, so we confer. (School 2, Teacher 2)

[*There was consensus among at least three of the schools that private tutoring was both ineffective and unnecessary for the IBDP curriculum.*]

3.5.4. SCHOOL SIZE AND RESOURCES

There were considerable differences in size among the five participating schools. An important implication of this was diversity in terms of the amount of school resources and variations in the allocation of school resources. For instance, the largest participating school offered students a choice of 45 IBDP subjects compared to only 17 in the smallest school.

[The largest participating school offered students a choice of 45 IBDP subjects compared to only 17 in the smallest school.]

Within this context, the level of support offered to students in the university application process varied between schools. At one of the larger schools, it was reported that there were two full-time university counselors advising approximately 340 students. The students at this school received ample advice about suitable universities through frequent meetings, personality tests, visits from university representatives, and trips abroad to open days. As one of the students noted, “We have regular college visits throughout the year from universities all over the world from Hong Kong to the U.S. to Europe. They really allow you to spend time interacting personally with the admissions people to see if that is what you want.” (School 5, Student 2)

This contrasted with experiences at the smaller schools where the students described a more informal support network from teachers, rather than designated university counselors, and were more likely to seek advice from family members. As one student explained, this provided a more personal approach which could come at the expense of more expert advice:

To be honest as our school is quite a small school, it may be good that the school can focus on each of us more, because we have small classes, but also because the faculty size is also small, there were not many chances to get a really wide range of help or advice. (School 3, Student 2)

3.6. SUMMARY AND IMPLICATIONS

3.6.1. UNIVERSITY RECOGNITION

The views expressed by interviewees across the five schools were consistent with the existing literature showing that the IBDP is held in high regard by universities worldwide (Brunold-Conesa, 2010; van Oord, 2007; Sjogren & Campbell, 2003). Moreover, this chimed well with views that the IBDP provides an ‘educational Nansen passport’ (Peterson, 1972) by enabling internationally

orientated students to distinguish themselves in the context of increasing competition for entry to top universities (Doherty, 2009; Lowe, 2010; Tarc 2009).

There were commonalities between findings of our case study and existing literature concerning the underlying reasons behind the IBDP's strong reputation. Consistent with previous studies (Coates *et al.*, 2007), our interview data illuminated a perception among participants that universities around the world (e.g., ranging from top U.S. universities to Asian universities such as South Korean universities) value the holistic approach of the IBDP that aims to provide both a broad and academically rigorous curriculum.

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At the same time, however, the multi-site case study provided new insights into the geography of IBDP university reputation. The participants supported previous research reporting that the IBDP is increasingly perceived as superior to national curriculums by universities in the U.K. (Jenkins, 2003), Australia and New Zealand (Coates *et al.*, 2007), and South East Asia (Lee, Hallinger, & Walker, 2012a). The interviewees added that they perceived that the reputation of the IBDP is growing in East Asian countries such as South Korea.

Nonetheless, some teachers and students in our case study schools perceived that the IBDP remains under-appreciated by U.S. universities compared to the AP program and SAT. This perception should be explored further by IB as in reality, data shows that the total number of IBDP exams taken has steadily increased across different U.S. states, which reached 165,938 as of 2009 (IB, 2012a). In this regard, Gehring (2001) summarized the growing reputation of the IBDP in the U.S. as the "Cadillac of College-Prep Programs." Echoing this feature, our quantitative analysis of university destination indicates that the most popular destination of IBDP graduates from China over the last ten years was the U.S.

3.6.2. UNIVERSITY STUDY SKILLS

As shown in our quantitative analysis, students reported that the IBDP prepared them slightly-to-moderately well for university studies. Interviewees in our multi-sited case study were generally more positive about the program, with the majority stating that the IBDP provided students with

studies skills central to success at university. This result is in accordance with research of the IBDP in the U.S. by Conley and Ward (2009, p. 7) who found a, “strong relationship between the IB Diploma Programme and standards for college readiness and success.”

In our study, teachers and administrators contended that the underlying reason for this success was the breadth of the IBDP curriculum, as opposed to the depth of content. More specifically, they argued that the Core Components provided students with important study skills that stand them in good stead for university assessments. This view reinforced the literature, which highlights the relative merits of Extended Essay for essay writing (Inkelas *et al.*, 2013) and TOK for critical thinking (Gazda-Grace, 2002).

Additionally, teacher, and administrator interviewees expressed a belief that CAS provided students with an opportunity to gain relevant skills including communication, leadership, and time management that are important for success at university. Despite this, further discussion illuminated that teachers were concerned that, in the context of a results-oriented culture, students did not prioritize the CAS.

Moreover, the interview data reinforced previous research (Taylor and Porath, 2006) revealing that, despite offering high-quality university preparation, the rigor of the IBDP curriculum could result in student anxiety and stress. The interviewees also cautioned that the heavy workload could restrict time allocated to the development of non-academic Learner Profile traits, such as ‘balanced’, through out-of-school activities.

3.6.3. IBDP STUDENTS CONFIDENT ABOUT TRANSITION TO UNIVERSITY

Admission to university was taken for granted by the IBDP students interviewed. Indeed, as has previously been highlighted in the literature, many students opted to take the IBDP as a means to gain an advantage in the admissions process for universities worldwide (Bailey & Karp, 2003; Doherty, 2009; Paris, 2003).

The IBDP students in China were also confident about their transition to university. As reported in our interview data analysis, students perceived that their study skills gained

[The interview data reinforced previous research (Taylor and Porath, 2006) revealing that, despite offering high-quality university preparation, the rigor of the IBDP curriculum could result in student anxiety and stress.]

during the program equipped them with the tools for success at university. Furthermore, they often went beyond this to reveal a perception that they are *better* prepared for university compared to A-Levels, AP program, and Gaokao graduates. This signifies that IBDP students in the case study schools internalized ideas about the superiority or academic rigor of the program in terms of being for “smart kids” (Paris, 2003) and for “those destined for university” (Doherty, 2009).

3.6.4. ASIAN STUDENTS AND IBDP PEDAGOGY

There is growing literature stressing the need to problematize negative stereotypes of Asian learners as being deficient in certain educational traits (Biggs & Watkins 2001; Ryan 2007; Shi, 2006). Whilst being careful not to portray a simplified dichotomy between Asian and Western learners, further studies have developed a ‘surplus model’ of Asian learners, emphasizing their socio-cultural strengths in education (Lee, 1996; Ryan, 2010). The interviewees concurred with this line of research, maintaining that IBDP students of Asian descent in China generally invest significant time and effort in their studies. Indeed, this was reported to be advantageous for managing the demands of the highly rigorous IBDP curriculum.

Equally, however, the participants noted that Asian IBDP students in China often initially struggled with certain aspects of the curriculum, especially critical thinking and communication. This resonates with findings of previous research (Gan, 2009; Zhang & McGrath, 2009) and may reflect the emphasis on these characteristics rooted in the Western educational tradition of the IB program (Drake, 2004; van Oord, 2007; Walker, 2010).

Previous research has recommended that, in response, teachers should adapt their pedagogy to engage Asian students more effectively through constructivist learning approaches (Chan, 2001) and problem-based learning (Stokes, 2001). The IBDP teachers in this study reported putting this theory into practice by promoting student interaction through classroom discussions, group work, and presentations. Nevertheless, teachers also argued that the requirement to cover a large volume of content alongside a pragmatic focus on assessments often restricted such pedagogical practices.

[The participants noted that Asian IBDP students in China often initially struggled with certain aspects of the curriculum, especially critical thinking and communication. This resonates with findings of previous research (Gan, 2009; Zhang & McGrath, 2009).]

3.6.5. IBDP PHILOSOPHY

The interviews deepened the existing literature on tensions between the philosophical underpinnings and the pragmatic realities of teaching the IB. There was concern that Learner Profile traits may not be promoted in the delivery of the program. The interviewees concurred with a previous study (Wells, 2011) revealing that this was primarily a consequence of limited guidance from the IBO, which results in a heavy reliance on teachers actively utilizing the Learner Profile in the classroom.

[The interviews deepened the existing literature on tensions between the philosophical underpinnings and the pragmatic realities of teaching the IB.]

Moreover, interviews confirmed existing literature on the Asian socio-cultural emphasis on assessments (Zhao, 1998; Kember, 2000; Biggs, 1996). In the context of the IBDP schools in China, this emphasis on assessments led to an important finding that high achieving IBDP students may not be sufficiently prioritizing CAS, which served as a ‘box-ticking’ exercise for many.

This diminished importance of the Learner Profile and CAS by IBDP schools in China reflects wider tensions of the expansion of the IBDP into new contexts (Drake, 2004; Tarc, 2009; Bunnell, 2008). These ongoing tensions have implications on the delivery of the IBDP in China in terms of uncertainty that IBDP schools promote core values of the program such as active global citizenship (Bunnell, 2008; Hayden & Thompson, 1995) and intercultural understanding (James, 2005; Haydon & Wong, 1997).

3.6.6. PRIVATE TUTORING

Our interview data shed light on the under-researched area of private tutoring for IBDP studies. The majority of IBDP teachers interviewed discouraged private tutoring and contended that it was ineffective for IBDP studies with the exception of Math and Languages. This stands in contrast with previous research on private tutoring for the Gaokao which has indicated effectiveness for some specific student populations (Zhang, 2011). An explanation offered by the interviewees was the nature of IBDP assessment requires analytical and critical thinking rather than the rote-learning strategies often employed by private tutors.

4. SYNTHESIS OF QUANTITATIVE AND QUALITATIVE STUDIES

4.1. INTRODUCTION

In this section, we outline some commonalities and differences between the findings of our quantitative and qualitative studies. The majority of findings reinforced and expanded on each other, particularly the qualitative findings were able to fill in the gaps in terms of explaining contentious or unexpected findings. And vice versa, the quantitative findings were recapitulated according to the major issues discovered in the qualitative findings. Overall, we found six common points in the synthesis of quantitative and qualitative findings, each with distinct nuances.

4.2. HIGH EDUCATIONAL EXPECTATIONS OF IBDP STUDENTS IN CHINA

As previously explained, it is government policy in China that admission to international schools is restricted to foreign passport holders.²⁸ During our multi-site case study, the nationality of IBDP students were predominantly non-Chinese nationals of Asian descent, particularly from Singapore, South Korea, and Taiwan, or U.S. and Western European passport holders of Asian descent. In a similar vein, the IB's data of self-reported nationality of IBDP graduates in the 2011 and 2012 cohort in China showed that 63% of them reported Asian country nationality, although out of the 260 participants from our online survey data, 60.8% were U.S. or Western Europe passport holders and 28.1% held Asian country passports only. This knowledge of the restrictive government policy coupled with observations from our quantitative and qualitative findings leads us to tentatively conclude that one of the major groups of IBDP students in China are from an Asian heritage but with foreign citizenship.

From our interview findings, this ethnic Asian heritage of IBDP students in China influences their values and expectations for education, accentuating their high hopes for 'trophy admissions' to high-ranking universities and emphasis on high results in assessments. In line with these high expectations, it was found in both our quantitative and qualitative data that attending university is taken for granted by the vast majority of IBDP students. This tendency towards university admission is supported by our quantitative archival data which showed

[Our quantitative and qualitative findings leads us to tentatively conclude that one of the major groups of IBDP students in China are from an Asian heritage but with foreign citizenship.]

²⁸ There are some exceptions to this rule as some Chinese nationals without foreign passports do enter national schools offering the IBDP. We note that one of the case schools was a state-funded school where we could identify these Chinese nationals.

that alternatives to universities such as special colleges/universities only accounted for 7.1% of all IBDP graduate destinations.

These ambitions were not unfounded as both our quantitative and qualitative findings revealed that the IBDP was successful in enabling IBDP graduates in China to enter top-ranking universities. From our archival data, 71.6% of IBDP graduates from 2002 to 2012 attended one of the top 500 universities in the world; the median ranking was 71. This track-record of the IBDP as vehicle to university entry was acknowledged by major stakeholders in IB schools in China – administrators, teachers, and students – who often perceived the IBDP as being superior to other programs in terms of its breadth and rigor. They also emphasized that the IBDP was a way for high achieving students to distinguish themselves from graduates of other curriculums due to the rigorous IBDP grading structure.

[From our archival data, 71.6% of IBDP graduates from 2002 to 2012 attended one of the top 500 universities in the world; the median ranking was 71.]

4.3. PREFERENCE FOR MAJOR U.S. UNIVERSITIES

IBDP China graduates ‘Go West’ to U.S. universities as their destination of choice. From our quantitative archival data, over half (51.1%) of IBDP graduates schooled in China went to the U.S. for university. This is significantly more than local Chinese undergraduates, where previous findings showed that less than 30% went to North America.

From our qualitative interview findings, we propose that this U.S. focus is due to a combination of factors. First, as discovered from our quantitative and qualitative findings, a large proportion of IBDP students in China are U.S. passport holders. As such, for tuition fee and existing social support network reasons, the U.S. is the logical choice of destination for many of these students. Second is the Asian socio-cultural focus on high grades in assessments and entry into top universities. The U.S. has the highest concentration of the top universities in the world thus attracting high achieving Asian IBDP students. Third, IBDP students schooled in China reap the benefits of the growing reputation of the IBDP in the U.S. for providing a first-rate education. However, qualitative interview data revealed that there is a ‘subjective perception’ among IBDP students and teachers that U.S. universities do not give the IBDP the recognition it deserves, primarily compared with the AP program.

4.4. BREADTH AND RIGOR OF CURRICULUM AS POSITIVE CHARACTERISTICS OF THE IBDP

Quantitative and qualitative results provide a mixed view on the breadth and rigor of the IBDP. Our survey data found that the great majority of IBDP graduates gained admission to high-ranking universities around the world. In addition, quantitative data analysis showed that IBDP graduates perceived Subject Requirements to be slightly to moderately helpful for University Preparation. This pattern of descriptive statistics was further confirmed by SEM analyses where we identified both Subject Requirements and IB Learner Profile as significant predictors of university preparation. To explain this relatively positive response, our qualitative data revealed that most of student and teacher participants valued the breadth and rigor of the IBDP for preparing students for the workload of university studies. However, participants raised an issue that some students could not cope with the IBDP workload and rigor, which could be a cause of student anxiety and stress.

4.5. SIGNIFICANCE OF IBDP EXAMS ON UNIVERSITY ENTRANCE AND STUDY

Our quantitative findings revealed that achieving high results in IBDP exams is a strong indicator for entrance to high-ranking universities and to maintaining a good university GPA. This finding indicates that IBDP exam results are not just a predictor of gaining entrance but also continued success at university. This was reflected in our qualitative findings, where teachers and administrators reported that students who did well in the IBDP, often “coast” through the first year of university. It was also prevalent in our interview findings that IBDP graduates schooled in China built up considerable confidence about their academic ability, which often translated to confidence towards university preparation and their university studies.

4.6. ROLE OF CORE COMPONENTS IN PREPARATION FOR UNIVERSITY STUDY

Our quantitative analysis found that IBDP graduates rated Core Components as only slightly helpful to their making their university study successful. Furthermore, the SEM analysis did not support a statistically significant relationship between Core Components and University Preparation. To explain this unexpected finding, our interview data indicated that a results-oriented culture coupled with a binary pass/fail nature, encouraged students to neglect CAS, which was often treated as a ‘box-ticking’ exercise by students.

[Our quantitative findings revealed that achieving high results in IBDP exams is a strong indicator for entrance to high-ranking universities and to maintaining a good university GPA.]

4.7. IMPORTANCE OF LEARNER PROFILE FOR UNIVERSITY PREPARATION BUT NOT PRIORITIZED

Both descriptive statistics and SEM results supported the importance of the IB Learner Profile, focusing on non-cognitive areas, in university preparation. Interview data supported this relationship. Teachers and administrators from our interviews conceived university preparation as the equipping of students with broader study skills, which include critical thinking, communication, and time management, rather than ability to pass examinations. This finding was evident in teachers' description of their pedagogical approaches to focus on university study skills rather than rote-learning. Moreover, students reported that their acquisition of these learner attributes instilled in IBDP graduates considerable confidence for their university preparation. At the same time, however, some of the interview participants raised an issue or concern that, although the Learner Profile was in theory a core aspect of the IBDP, limited guidance by the IBO on the Learner Profile meant that its promotion largely depended on the discretion of the teachers and schools. As a consequence of the results-oriented culture in IBDP schools in China, where non-academic aspects of the curriculum often fade to the background, the Learner Profile could be under-prioritized. This mixed response was supported by our quantitative results which found that the latent construct of IB Learner Profile was regarded by IBDP graduates as conducive to better university preparation.

[Both descriptive statistics and SEM results supported the importance of the IB Learner Profile, focusing on non-cognitive areas, in university preparation. Interview data supported this relationship.]

5. CONCLUSIONS

5.1. ANSWERS TO RESEARCH QUESTIONS

To summarise our findings and to conclude the report, we provide answers to the key research questions outlined in our research proposal.

Who are the students enrolled in the IBDP in China?

- Our quantitative and qualitative data indicated that the majority of IBDP students in China were of Asian descent but with non-Chinese citizenship. First, our survey data found 60.8% of IBDP students were passport holders of Western European countries or the U.S., while 28.1% were nationals of other Asian countries. Second, multi-site case study interviewees suggested that most IBDP students who hold Western European or U.S. passports were of Asian heritage. This observation was further confirmed with the IB's data of the self-reported nationality of IBDP graduates in the 2011 and 2012 cohort—i.e., 63% self-reported having an Asian country nationality.
- The primary reason for the under-representation of Chinese nationals was that they are restricted from attending international IBDP schools in China. Yet, there are a minority of “local” schools where mainland Chinese students can access IB programs through state-funded schools offering the IBDP.
- In terms of family background, our survey data revealed that the majority of participants (68.1%) were from relatively high-income households (i.e., annual income > 80,000 USD).
- Our survey data also showed that most parents of the IBDP graduates had a 4-year university degree, a Master’s degree, or a doctoral degree (86.6% for fathers and 70.4% for mothers).

What are the university destinations of IBDP students schooled in China?

- Our archival data showed that the most common university destination for IBDP graduates was the U.S., with over half of the IBDP graduates (51.1%) from 2002 to 2012 attending U.S. universities, followed by the U.K. (11.4%) and Canada (10.7%). This was significantly more than the 28.8% of overseas Chinese undergraduates studying in North America highlighted in previous research.
- First, the popularity of U.S. universities reflected a geographical concentration of academically strong institutions that were attractive to IBDP graduates. Indeed, our archival data revealed that 71.6% of IBDP graduates attended top 500 universities worldwide.

- Second, this also reflected the high proportion of U.S. passport holders among IBDP students in China. Our case study data found that nationality could influence university destination choices due to tuition-fee incentives and existing social support networks.
- Third, high admissions rates to U.S. universities are indicative of the growing recognition of the IBDP. However, in contrast to this, some case study participants felt that the IBDP remains under-recognised in the U.S., relative to the AP program and SAT.

What resources do IBDP students use during their university application process?

- Resources available to IBDP students in the university application process varied considerably between case study schools. At the larger case study IBDP schools students reported attending frequent meetings with designated university counsellors to discuss suitable universities and to receive support in practical aspects of the application process such as writing personal statements. In addition, the students thought visits from university representatives were especially helpful due to providing space to interact personally with admissions staff.
- At smaller case study schools, the students described a more informal support network from teachers, rather than designated counsellors at the school. Such students often sought to compensate for the relative lack of resources by seeking advice from alternative sources, such as family members.
- Nevertheless, teachers and administrators in the case study schools remarked that there was a socio-cultural emphasis on ‘trophy admissions’ to high ranking universities. They were concerned that parents often aspired to send their children to such institutions regardless of potential suitability.

To what extent do IBDP teachers and administrators think that the IBDP is helpful for students' university preparation?

- Teachers and administrators in our case studies concurred that the IBDP prepared students well for university studies. For example, they perceived that the academic content covered over the IBDP, especially in Higher Level (HL) courses, was often equivalent to that of first year university.
- However, they thought that study skills gained by IBDP graduates were more important for university preparation than the academic content of the IBDP. In particular, it was reported that students became proficient at communication, critical thinking, and time management.
- To support the development of study skills, teachers reported endeavouring to go beyond a rote-learning approach to employ ‘student-centered teaching’ including classroom discussions, group work, and presentations. This was deemed to be especially important for some Asian

students who initially struggled with classroom interaction. Yet, teachers also contended that the requirement to cover a large volume of content, alongside a pragmatic focus on assessments, often restricted such pedagogical practices.

What particular features of the learning experiences in the IBDP facilitate students' university study?

- First, both our qualitative and quantitative findings showed that the IB Learner Profile with a focus of non-cognitive dimensions was important in promoting students' confidence in their transition to university.
- Second, findings from our quantitative and qualitative analysis revealed that the breadth and rigor of the IBDP was an important distinguishing characteristic of the program. Quantitative data showed that IBDP graduates perceived Subject Requirements to be helpful for their university preparation. Case study interviews shed light on this finding. Teachers and administrators reported that the quantity and diversity of work required to complete the IBDP meant that IBDP graduates were often well prepared for university studies. However, interview data also revealed that some students struggled to cope with the workload of the IBDP, which could be a cause of student anxiety and stress.
- Third, in all five schools, teachers and administrators placed significant emphasis on Core Components for providing students with a holistic education relevant for university life. They argued the process gave students the *opportunity* to develop valuable study skills including communication, critical thinking, and time management. However, quantitative analysis and particularly descriptive statistics showed that IBDP graduates rated Core Components as only slightly helpful for university preparation. This corresponded to concern among interviewees that, as CAS in particular was not sufficiently assessed, it was often neglected by high-achieving students in a results-oriented culture.

Do IBDP students schooled in China feel prepared for university study abroad?

- Overall, our quantitative analysis found that IBDP graduates viewed their experiences of the IBDP as slightly to moderately positive in their preparation for university study abroad. In accordance with these results, many students in our case studies described that following the completion of such a highly rigorous and academically challenging program, the transition to an internationally recognised university was a natural progression. Indeed, alternatives to university entry were often not seriously considered.
- The students perceived that study skills gained during the IBDP would equip them with the tools for success at university. Above all, they emphasized the importance of time management skills.

In each of the five schools, students reported that after experiencing the breadth of the IBDP, through the Core Components and Subject Requirements, they were confident about being able to organize their time effectively at university.

Do current IBDP students think that their learning experiences of the IBDP are unique and significant? If so, why?

- The majority of students interviewed at case study schools thought that the IBDP was significantly distinct from other curriculums. Following this, they often perceived IBDP graduates to be better prepared for university studies relative to A-Level, AP program, and Gaokao graduates.
- Central to this was a confidence that the Subject Requirements and Core Components required students to learn how to cope with a heavy workload and also provided opportunities to develop study skills relevant to university. Especially, they contended that the experience of the Extended Essay enabled IBDP students to become comfortable with writing university level academic papers, when students of other curriculums may initially struggle.
- Nevertheless, the IBDP students reported a frustration that the rigor of the IBDP was underappreciated by universities in U.S. both in terms of admissions and credits. As previously noted, this view may only be a ‘subjective perception’ given the high proportion IBDP students enrolled in major U.S. universities. However, the IB may wish to investigate why this view exists.

What are the structural relations among student performance on IBDP exam scores and university destination and GPA, when other demographic variables are controlled for?

- The results of our quantitative analyse showed that IBDP exam scores had a significant effect on both IBDP graduates’ university destination and GPA. This suggests that high achievers in IBDP exams tended to attend higher ranking universities and also performed well in their university studies; a student’s potential academic ability could be predicted by IBDP exam scores, but not by other family backgrounds such as mother education and household income.

5.2. DIRECTIONS FOR FUTURE RESEARCH

To contribute further to the literature regarding student experiences of the IBDP in China, and how the program prepares graduates for university, we recommend that future studies should examine the following issues:

- To supplement our findings of university destinations covering the period between 2002 and 2012, we recommend a larger scale study that addresses the period before 2002. Additionally,

given that our analysis focused on descriptive trends of university destination during the period, there should be more in-depth investigations on the pattern of university destination among IBDP graduates in China through an inferential statistical model with a substantial database.

- Future research could build on our multi-site case study analysis by conducting interviews with IBDP graduates currently studying at university. This would provide an opportunity for IBDP graduates to elaborate on how the program prepared them for university studies. Further, it would enable participants to discuss retrospectively whether the self-confidence shown among IBDP students about future success at university, identified in this report, was matched in reality.
- All schools that participated in our case study were IBDP only schools. That is, they did not offer the Primary Years Program (PYP) or the Middle Years Program (MYP). This was highlighted by administrators as a source of difficulty in promoting the core goals and values of the program, as students were only introduced to the IB at Diploma level. Responding to this, we recommend conducting case studies of full-continuum IB schools in China. This would shed light on whether such schools were more successful at ensuring authentic engagement with the IB philosophy and the impact this had on students' university preparation.
- Related to the above point, our case studies revealed a concern that the Learner Profile may not be prioritized by IBDP schools in China. Both teachers and administrators thought that this was a symptom of limited guidance from the IBO about how to promote the traits combined with the fact that the Learner Profile is a non-assessed component of the program. Similarly, it was argued that, in a result-oriented culture, students often neglect CAS as this is perceived to have minimal consequences for IBDP grades and university admissions. In response, we recommend future research into how to best promote authentic engagement with the Learner Profile and CAS. This is especially important as the IBDP continues to expand into schools in results-oriented socio-cultures in the Asia-Pacific region and other parts of the world.

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7. APPENDICES

Appendix 1. SEM Results: Standardized Regression Coefficients

		Estimate
University Preparation	<---	IB Learner Profile .533
University Preparation	<---	Core Components .127
University Preparation	<---	Subject Requirements .202
Q8_1	<---	Subject Requirements .750
Q8_2	<---	Subject Requirements .676
Q8_3	<---	Subject Requirements .653
Q8_4	<---	Subject Requirements .716
Q8_5	<---	Core Components .565
Q8_6	<---	Core Components .620
Q8_7	<---	Core Components .557
Q9_1	<---	University Preparation .744
Q9_2	<---	University Preparation .808
Q9_3	<---	University Preparation .865
Q9_4	<---	University Preparation .899
Q9_5	<---	University Preparation .674
Q9_6	<---	University Preparation .774
Q10_8	<---	IB Learner Profile .660
Q10_7	<---	IB Learner Profile .626
Q10_6	<---	IB Learner Profile .845
Q10_5	<---	IB Learner Profile .837
Q10_4	<---	IB Learner Profile .832
University Ranking	<---	IB Exam Scores .350
University GPA	<---	IB Exam Scores .348
University Ranking	<---	Household Income -.043
University GPA	<---	Household Income .024
University Ranking	<---	Mother Education .011
University GPA	<---	Mother Education .060

Appendix 2. SEM Results: Unstandardized Regression Coefficients

			<i>Coeff.</i>	<i>S.E.</i>	<i>C.R.</i>	<i>p</i>
University Preparation	<---	IB Learner Profile	.743	.167	4.444	***
University Preparation	<---	Core Components	.137	.156	.875	.381
University Preparation	<---	Subject Requirements	.199	.095	2.103	.035
Q8_1	<---	Subject Requirements	1.000			
Q8_2	<---	Subject Requirements	.726	.075	9.647	***
Q8_3	<---	Subject Requirements	.909	.097	9.360	***
Q8_4	<---	Subject Requirements	.905	.089	10.195	***
Q8_5	<---	Core Components	1.000			
Q8_6	<---	Core Components	1.071	.159	6.726	***
Q8_7	<---	Core Components	.821	.130	6.312	***
Q9_1	<---	University Preparation	1.000			
Q9_2	<---	University Preparation	.947	.073	12.913	***
Q9_3	<---	University Preparation	1.020	.073	13.922	***
Q9_4	<---	University Preparation	1.178	.081	14.526	***
Q9_5	<---	University Preparation	.874	.083	10.575	***
Q9_6	<---	University Preparation	.905	.073	12.341	***
Q10_8	<---	IB Learner Profile	1.258	.143	8.819	***
Q10_7	<---	IB Learner Profile	1.269	.145	8.783	***
Q10_6	<---	IB Learner Profile	1.429	.163	8.760	***
Q10_5	<---	IB Learner Profile	1.444	.166	8.691	***
Q10_4	<---	IB Learner Profile	1.066	.137	7.777	***
Univ. Ranking	<---	IB Exam	6.701	1.641	4.084	***
GPA	<---	IB Exam	.806	.182	4.425	***
Univ. Ranking	<---	Household Income	-1.519	2.528	-.601	.548
GPA	<---	Household Income	.100	.278	.361	.718
Univ. Ranking	<---	Mother Education	.899	5.854	.154	.878
GPA	<---	Mother Education	.581	.645	.900	.368

Note: N = 151, ***p<.001. When the critical ratio (CR) is > 1.96 for a regression weight, it indicates that either a path or a factor loading becomes significant at the .05 level or better.

Appendix 3. SEM Results: Correlation Matrix

			Estimate
Subject Requirements	<-->	Core Components	.721***
IB Learner Profile	<-->	Subject Requirements	.657***
IB Learner Profile	<-->	Core Components	.774***
IB Exam	<-->	Subject Requirements	.127
IB Exam	<-->	Core Components	.064
IB Exam	<-->	IB Learner Profile	-.081
Household Income	<-->	Mother Education	.127*
IB Exam	<-->	Household Income	.209**
IB Exam	<-->	Mother Education	.248**

Appendix 4. SEM Results: Squared Multiple Correlations

		Estimate
University Preparation		.625
GPA		.139
Univ. Ranking		.120
Q10_4		.444
Q10_5		.670
Q10_6		.692
Q10_7		.700
Q10_8		.714
Q9_6		.599
Q9_5		.454
Q9_4		.808
Q9_3		.749
Q9_2		.653
Q9_1		.553
Q8_7		.311
Q8_6		.384
Q8_5		.320
Q8_4		.513
Q8_3		.426
Q8_2		.457
Q8_1		.563

Appendix 5. Interview Protocols

Teacher/Administrator Interview Template

Introduction (5 minutes)

1. Please introduce yourself and describe your role at your school.

Components of the IBDP Curriculum & University Transition (25 minutes)

2. To the best of your knowledge, how well do the academic subjects required in the IBDP prepare students for their transition to university study?
3. In your opinion, what are the specific pedagogical characteristics of the IBDP that help students prepare for their transition to university studies? (for example, broad curriculum with subjects in 6 different areas, studying at least 3 subjects in depth, spreading all subjects over 2 years, or the use of a range of assessment strategies).
4. Do you find the experience gained by the students from the Core Components of the Theory of Knowledge (TOK) course, the Extended Essay (EE) and Creativity Action Service (CAS) to be beneficial? Are they helpful for university study preparation?
5. In your opinion, what are some of the shortcomings of the IBDP?
6. Do you feel there is any distinct advantage for IBDP graduate university entrance compared to their non-IBDP counterparts (in other international programs such as AP program and A Levels)?
7. What are your observations on the particular distribution of nationalities among your IBDP students in your school undergoing? To what extent do you think student nationality influences choice of university?

IBDP Learner Profile and Pedagogy (5 minutes)

8. In your opinion how well suited is the design of the IBDP to nurture traits of the IB learner profile?

9. What key principles do you apply in your pedagogical practices in teaching the IBDP to your students?

Private Tutoring (5 minutes)

10. Are you aware of your students taking part in any out of school tutoring? If so, what do you think are the primary reasons for this?
11. In your opinion, how effective do you think out of school tutoring is in terms of students' IBDP results?

Teaching Experience (5 minutes)

12. Do you believe being located in an international school in China has any particular influence on how you teach/administer the IBDP?
13. Do you think there are any differences in the way the IBDP is taught/administered in international schools compared with national schools?

Student Focus Group Interview Template

Introduction – five minutes

1. Please introduce yourself saying your name, your nationality or nationalities (for dual passport holders) and which languages you can speak?

Components of the IBDP Curriculum – fifteen minutes

2. Do you think the IBDP is particularly academically challenging relative to other curriculums? Please give examples.
3. Are there any particular attributes or values that you associate with an IBDP graduate?
4. Did you find the Core Components of the Theory of Knowledge (TOK) course, Extended Essay (EE) and Creativity Action Service (CAS) to be beneficial?
 - a. If yes, what did you learn?
 - b. If no, why?

University Transition – ten minutes

5. Do you think that by completing the IBDP you can expect to gain entrance to university?
6. What support are you offered by the school in deciding which universities and courses to apply for?
7. To what extent did the passport you hold influence your choice of university destination after the IBDP?

Distinction – ten minutes

8. Do you think that the IBDP is highly regarded by prestigious universities around the world? Explain your answer.
9. Do you feel that the IBDP gives the student a competitive edge in the transition to university – and especially international universities – compared with:
 - a. i) The national public education system in China?
 - b. ii) Other international programs or curricular such as the AP program and A-Levels
10. Based on your understanding of university studies, are you confident that the IBDP provides you with effective academic preparation for higher education?

Private tutoring – five minutes

11. Did you take part in out of school tutoring? If so, what was the primary reason for taking up tutoring?
12. Was the tutoring aimed specifically at the IBDP curriculum? If so, was the tutor specially qualified to teach IBDP subject matter?
13. Was the tutoring effective for the IBDP in general and the IBDP final examination in particular?

Appendix 6. Relationships between Pattern Codings

Positive Relationships		Effect	Outcome	School 1	School 2	School 3	School 4	School 5	Total
Input				1	1	1	1	1	5
CAS: communication/leadership/risk-taking	Leads to	University transition: study skills		1	1	1	1	1	5
Curriculum: rigorous	Leads to	University transition: prepared for content		1	1	1	1	1	5
Curriculum: rigorous	Leads to	University recognition: internationally validated		1	1	1	1	1	5
Curriculum: rigorous	Leads to	University transition: study skills		1	1	1	1	1	5
EE: essay writing skills	Leads to	University transition: study skills		1	1	1	1	1	5
Learner profile: implicit not explicit	Leads to	Learner profile: teacher reliant		1	1	1	1	1	5
Pedagogy: analysis/communication/creativity	Leads to	University transition: study skills		1	1	1	1	1	5
University transition: study skills	Leads to	University transition: students very confident		1	1	1	1	1	5
TOK: higher-order thinking	Leads to	University transition: study skills		1	1	1	1	1	5
Asian: assessment focus	Leads to	CAS: not prioritized		1		1	1	1	4
Asian: assessment focus	Leads to	University entrance: taken for granted		1		1	1	1	4
Asian: lack analysis/critical thinking/communication	Leads to	Pedagogy: promote student engagement		1	1		1	1	4
Asian: lack analysis/critical thinking/communication	Leads to	Pedagogy: analysis/communication/creativity		1	1		1	1	4
CAS: community interaction	Leads to	CAS: communication/leadership/risk-taking		1	1	1		1	4
CAS: communication/leadership/risk-taking	Leads to	Core components: support university applications			1	1	1	1	4
Curriculum: holistic education	Leads to	University transition: prepared for content		1	1	1		1	4
Curriculum: rigorous	Leads to	Curriculum: weaker students struggle		1	1		1	1	4
Curriculum: rigorous	Leads to	IBDP students: stress		1	1		1	1	4

Curriculum: rigorous	Leads to	Pedagogy: pragmatic drift		1	1	1	1	1	4
Curriculum: rigorous	Leads to	University transition: students very confident	1	1	1	1			4
Pedagogy: analysis/communication/creativity	Leads to	Private tutoring: ineffective for IBDP		1	1	1	1		4
Pedagogy: promote student engagement	Leads to	University transition: study skills	1	1	1	1			4
Student support: ample support	Leads to	Private tutoring: teacher support sufficient		1	1	1	1		4
University transition: prepared for content	Leads to	University transition: students very confident	1		1	1	1		4
Asian: assessment focus	Leads to	Private tutoring: high grade pressure	1	1	1				3
CAS: not prioritized	Leads to	Learner profile: teacher reliant	1		1	1			3
CAS: communication/leadership/risk-taking	Leads to	University transition: students very confident	1		1	1			3
Curriculum: holistic education	Leads to	University recognition: internationally validated	1	1	1	1	1		5
Curriculum: holistic education	Leads to	University transition: study skills	1		1	1			3
Curriculum: rigorous	Leads to	Student support: ample support		1	1	1	1		3
Curriculum: rigorous	Leads to	Private tutoring: high grade pressure		1	1	1			3
EE: essay writing skills	Leads to	University transition: students very confident		1		1	1		3
Learner profile: teacher reliant	Leads to	TOK: classroom use	1		1	1			3
Learner profile: not prioritised	Leads to	Learner profile: teacher reliant		1	1	1			3
Pedagogy: pragmatic drift	Leads to	Learner profile: not prioritized	1		1		1		3
University choice: ample support	Leads to	University transition: students very confident	1	1		1			3
Curriculum: perception of difficulty	Leads to	University transition: students very confident	1		1		1		3
Learner profile: implicit not explicit	Leads to	Learner profile: not prioritized		1	1	1			3
Asian: assessment focus	Leads to	IBDP students: stress	1		1				2
Asian: assessment focus	Leads to	University transition: lack life skills	1			1			2
Asian: assessment focus	Leads to	Learner profile: not prioritized		1	1				2
Asian: assessment focus	Leads to	Pedagogy: pragmatic drift	1		1				2

Curriculum: rigorous	Leads to	University entrance: taken for granted	1		1	2
EE: essay writing skills	Leads to	Core components: support university applications		1	1	2
International school: inter-cultural understanding	Leads to	University transition: students very confident		1	1	2
Learner profile: implicit not explicit	Leads to	Learner profile: time to integrate	1		1	2
IBDP grading: university application distinction	Leads to	University recognition: internationally validated	1		1	2
Curriculum: holistic education	Leads to	University transition: students very confident		1	1	2
Private tutoring: high grade pressure	Leads to	IBDP students: stress	1			1
Private tutoring: high grade pressure	Leads to	University transition: lack life skills			1	1
TOK: higher-order thinking	Leads to	Core components: support university applications		1		1
TOK: higher-order thinking	Leads to	University transition: students very confident	1			1

Negative Relationships								
Input	Effect	Outcome	School 1	School 2	School 3	School 4	School 5	Total
China: teaching restrictions	Negatively affects	Curriculum: holistic education	1	1			1	3
China: research restrictions	Negatively affects	EE: essay writing skills		1		1	1	3
Curriculum: holistic education	Negatively affects	University recognition: internationally validated	1				1	2
Private tutoring: extra-curricular trade-off	Negatively affects	Curriculum: holistic education	1					1

About the Education Policy Unit

- The Education Policy Unit (EPU) is a key unit for research in education policy, based at the University of Hong Kong.
- Established in September 2013, as part of the Faculty of Education, the Unit is under the direction of Professor Kai-Ming Cheng and the Deputy Director, Dr. Moosung Lee, and further is supported by a senior advisory committee and a working team of research and administrative staff.
- EPU strives to maintain a high level of expertise in policy analysis and evaluation with cutting-edge research methods.

Corresponding researcher:

Dr. Moosung Lee
Associate Professor, Faculty of Education
Deputy Director, Education Policy Unit
419 Runme Shaw Building
University of Hong Kong
Pokfulam, Hong Kong SAR
Telephone: (852) 28592525
Email: moosung1@hku.hk